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A THEORETICAL AND EXPERIMENTAL INVESTIGATION OF THE ACOUSTIC RESPONSE OF CAVITIES IN AN AERODYNAMIC FLOW

TECHNICAL REPORT No. WADD-61-75

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FLIGHT DYNAMICS LABORATORY
AERONAUTICAL SYSTEMS DIVISION
AIR FORCE SYSTEMS COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

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NOTICES

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FOREWORD

This report was prepared for the Flight Dynamics Laboratory, Aeronautical Systems Division, Wright-Patterson Air Force Base, Ohio. The research and development work was accomplished by Lockheed Aircraft Corporation, Georgia Division, Marietta, Georgia under Air Force Contract AF33(616)-6966, Project Nr. 1370, "Dynamic Problems in Flight Vehicles", Task Nr. 137005 "Methods of Noise Prediction Control and Measurement". Mr. D. L. Smith of the Dynamics Branch, Flight Dynamics Laboratory, Directorate of Aeromechanics, Deputy for Technology was Task Engineer. Research covered in this report started in February 1960 and is part of a continuing effort.

The authors wish to express their sincere appreciation for the valuable mathematical assistance and consultation given by Dr. J. F. Andrus of the Mathematical Analysis Department. Our thanks also to other members of the Sound and Vibration Section, without whose help the project could not have been completed, and to the AEDC personnel whose patience and cooperation contributed greatly to the experimental program.

ABSTRACT

Theory is developed for the resonant frequencies and pressure amplifications of a rectangular cavity of arbitrary dimensions in a flow field. An intermediate step involves the derivation of radiation impedance for a cavity at all Mach numbers, using the concepts of retarded potential theory. Experimental results are given for small cavities tested in the subsonic regime and for cavities up to 8" in length at supersonic Mach numbers from 1.75 to 5.0. Comparisons are drawn between theoretical and experimental frequency and amplitude response, indicating that the theory developed gives very good definition of the problem.

PUBLICATION REVIEW

This report has been reviewed and is approved.

FOR THE COMMANDER:

William C. Nielsen

WILLIAM C. NIELSEN
Colonel, USAF
Chief, Flight Dynamics Laboratory

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LIST OF SYMBOLS

a	$f_N L_z X/c(R^2 + X^2)$
A	simple source strength
b	$f_N L_z R/c(R^2 + X^2)$
c	velocity of sound
D	"Amplitude" radius, subsonic
D_s	"Amplitude" radius, supersonic
f	frequency, cps
f_N	natural frequency of cavity
F	total force on piston
g_n	defined by $g_n = \xi_n + i\eta_n$
i	$\sqrt{-1}$
k	wave number, ω/c
L	length of Helmholtz resonator neck
L_x	cavity length
L_y	cavity width
L_z	cavity depth
M	Mach number, u_f/c
n_x	length mode number
n_y	width mode number
n_z	depth mode number of room with all walls rigid
n	depth mode number of cavity (one side on depth axis open)
N	n, n_x, n_y
$\sqrt{\overline{p^2}}$	root-mean-square sound pressure
p_p	peak sound pressure

p_o	pressure at open end of cavity (peak)
P_s	model local static pressure
P_N	sound pressure level, db
q	free-stream dynamic pressure (psig)
r	distance from source to field point for stationary medium
R	radiation resistance
R_x	streamwise correlation coefficient
S	area of piston
t	time
u	dummy variable
u_f	forward velocity
u_p	particle velocity (peak)
v	dummy variable
V	cavity volume
X	radiation reactance
x, y, z	coordinates of source
x', y', z'	coordinates of field point
$\overline{T}$	average boundary-layer thickness
z_r	characteristic radiation impedance
Z_r	radiation impedance of piston (cavity)
σ	density of medium (static)
Δ	$\tan^{-1}(1/\beta)$
λ	wavelength
λ_N	cavity normalizing constant
ϵ_{n_x}	normalizing number
ϵ_{n_y}	normalizing number
ζ_c	characteristic acoustic impedance

~~ζ~~	~~ratio of cavity width to length, L_y/L_x~~
α	$\sin^{-1}(1/M)$
ω	Angular frequency
β	$\sqrt{1 - M^2}$, $M < 1.0$
β_s	$\sqrt{M^2 - 1}$, $M > 1.0$
δ	$\tan^{-1}(y'/x')$
δ_s	$\tan^{-1}(v'/u')$
γ	normalized frequency, kL_x
ξ	dummy variable
ξ_n	real solution of boundary function
η	dummy variable
η_n	imaginary solution of boundary function
ϕ	$\tan^{-1}\beta_s$
ϕ_N	characteristic equation
θ, r	cylindrical coordinates

All decibel units are referenced to 0 0002 dynes/cm^2

I - INTRODUCTION

The problem of acoustic response of a cavity or recess in the surface of an airborne vehicle is one which has assumed new dimensions of significance with the advent of supersonic flight. Experience with the problem to date has indicated that the severity of response depends in large measure on the airspeed, or perhaps more inclusively, the dynamic pressure associated with the flight condition. Thus, serious questions arise as to expected loads inside a cavity on a supersonic vehicle.

The problem is not simple; the investigations conducted to date have established this very clearly. The mechanisms involved appear in many respects to be simply the excitation of resonant response of a given enclosure; yet there are facets of the problem which appear to deviate markedly from such a phenomenon. For example, the Boeing Airplane Company (Ref. 1) concluded that for the problem as it was encountered on the B-47 aircraft, the mechanism was best defined as a pseudo-resonant phenomenon, in which the normal acoustic modes are modified in frequency by the presence of a bound vortex formation within the cavity. This vortex is presumed to alter the wave-propagation velocity in the upstream direction as compared with the downstream direction, thus in effect changing the resonant frequencies.

Krishnamurty (Ref. 2) conducted quite an extensive study of the problem from the viewpoint of the radiation of sound out of the cavity. He concluded that the phenomenon was more likely to be associated with the inherent instability of the separated boundary layer, which permits amplification of disturbances within certain limits of wavelength. This hypothesis leads to the ultimate question as to why the cavity response is not merely the amplification of a band of frequencies rather than the observed amplification of a single frequency within this band.

The approach followed in the present investigation is based on the hypothesis that whatever the forcing mechanism may be, conditions inside the cavity must ultimately follow the dictates of the characteristic acoustic response of the cavity. Thus, it is hypothesized that at least part of the overall solution to the problem lies in the definition of characteristic acoustic response of the cavity. Other considerations may then apply to effect the general solution, but a firm base will have been laid. On this premise, the theoretical investigation reported herein is primarily aimed at evaluation of the response of a cavity of arbitrary dimensions placed in a flow of arbitrary velocity, either subsonic or supersonic.

Experimentally, the program was aimed at as complete as possible documentation of the phenomena involved. In particular, it was desired to investigate a sufficient range of dimensional parameters to insure that results were of broad enough scope to avoid conclusions which might hold over only a limited range of cavity dimensions.

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II. THEORY

A. GENERAL CONSIDERATIONS

The objective of the theoretical treatment discussed herein is to develop expressions for the characteristic resonant response of a cavity, since it is hypothesized that this is the predominant phenomenon involved.

As shown by Morse (Ref. 3), the response of an enclosure is a function of:

1. The dimensions of the enclosure
2. The impedance of the boundaries
3. The location, distribution, and strength of the forcing source functions.

Previous work given in the classical literature provide the basis for the work reported herein. It is hypothesized that the phenomenon of sound generation in a cavity is basically that of an enclosure responding in its normal acoustic modes.

On this premise, the problem evolves into one of deriving the characteristic response function of a cavity from which its natural modes become evident. The model selected for the mathematics is a rectangular cavity of arbitrary dimensions, having five walls terminated in an infinite impedance and the sixth terminated in the radiation impedance of the cavity opening.

Toward this end, the major concern becomes that of deriving the radiation impedance of the rectangular cavity. A literature search reveals that Swenson and Johnson (Ref. 4) have indicated the form of such a derivation but do not give the derivation itself. Stenzel (Ref. 5) presents a study of this impedance for the static case. Although both of these reported results are of considerable help, it still remains to document more completely the impedance for the static case and to extend the results to include the effects of radiation into a medium which may be moving with either subsonic or supersonic velocity.

When considering the case of a moving medium, the fact that speed of the wave front is altered by motion of the medium must be taken into account. The upstream propagation velocity of a source disturbance is the speed of sound less the boundary-layer velocity. Therefore, at supersonic velocity there is no upstream propagation, except that which occurs in the subsonic region of the boundary layer. Garrick (Ref. 6) has shown the effect of a moving medium on radiation patterns and field strength of an acoustic source; and Garrick and Watkins (Ref. 7) have included the effect of forward velocity on the sound generation of a propeller. The retarded potential theory of the above references has been applied to the present impedance derivation, which considers the total effect of an assemblage of in-phase simple sources evenly distributed on the outer surface of a weightless piston of air in the mouth of the cavity.

Finally, the response of a simple cavity, as treated by Morse (Ref. 3) is discussed. This theory is appropriate for use if the depth is not very much less than the streamwise length of the cavity.

B. RADIATION IMPEDANCE

1. STATIONARY MEDIUM

The radiation impedance of the cavity in a stationary medium is assumed to be that of a rectangular piston set in a flat wall, very large with respect to the dimensions of the piston. The piston is assumed to be vibrating with velocity $u_p e^{i\omega t}$ and radiating into the space on one side of the wall only.

The radiation impedance, Z_r, is

$$Z_r = F/u_p e^{i\omega t} \tag{1}$$

where F is the total force exerted on the piston. The force, F, is equal to the integral of pressure, $p_p(x', y')$, over the area of the piston S, that is

$$F = \iint_S p_p(x',y')\, dx'dy' \tag{2}$$

The differential pressure at (x', y') on the piston due to radiation from a simple source at (x, y) is (Ref. 1),

$$dp_p(x',y') = i\omega\sigma u_p e^{i\omega t} \frac{e^{-ikr}}{2\pi r}\, dx\, dy \tag{3}$$

where

$$r = \sqrt{(x'-x)^2 + (y'-y)^2}$$

The total pressure at (x', y') assuming equal radiation intensity from all sources on the piston is:

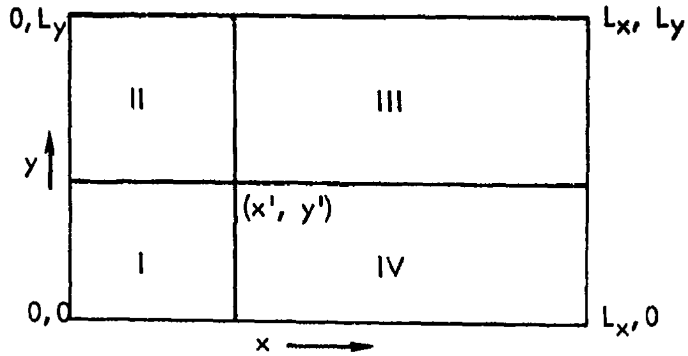
$$p_p(x',y') = \frac{i\omega\sigma u_p e^{i\omega t}}{2\pi} \iint_S \frac{e^{-ikr}}{r}\, dx\, dy \tag{4}$$

Using Eqs. (1), (2), and (4), the radiation impedance can be written as

$$Z_r = \frac{i\omega\sigma}{2\pi} \iint_S \left[\iint_S \frac{e^{-ikr}}{r}\, dx\, dy \right] dx'\, dy' \tag{5}$$

Since Eq. (5) has r in the denominator, it is seen that a singularity will exist when x = x' and y = y', and Eq. (4) will yield infinite pressure. In order to circumvent this difficulty it is expedient to subdivide the piston into four areas whose common point is the locus of the singularity. The integration can then be carried out in four steps as shown on the following page.

FIGURE 1a.
FIELD POINT CONNOTATION



From examination of Fig. 1a, it can be seen that Eq. (5) can be expressed as the sum of the integrals over the four indicated areas.

$$Z_r = \frac{i\omega\sigma}{2\pi}\int_0^{L_y}\int_0^{L_x}\left[\int_0^{y'}\int_0^{x'}\frac{e^{-ikr}}{r}\,dx\,dy + \int_{y'}^{L_y}\int_0^{x'}\frac{e^{-ikr}}{r}\,dx\,dy\right.$$
$$\left. + \int_{y'}^{L_y}\int_{x'}^{L_x}\frac{e^{-ikr}}{r}\,dx\,dy + \int_0^{y'}\int_{x'}^{L_x}\frac{e^{-ikr}}{r}\,dx\,dy\right]dx'\,dy' \qquad (6)$$

The four integrals obtained by integrating Eq. (6) with respect to x' and y' over the indicated limits are equal, since the inner limits are the variables for the (x', y') integration and will vary over all the cavity area; therefore,

$$Z_r = \frac{i2\omega\sigma}{\pi}\int_0^{L_y}\int_0^{L_x}\int_0^{y'}\int_0^{x'}\frac{e^{-ikr}}{r}\,dx\,dy\,dx'\,dy' \qquad (7)$$

Making the following change of variables for ease of integration,

$$x' - x = \xi \qquad y' - y = \eta \qquad (8)$$

there results,

$$Z_r = \frac{i2\omega\sigma}{\pi}\int_0^{L_y}\int_0^{L_x}\int_0^{y'}\int_0^{x'}\frac{e^{-ikr}}{r}\,d\xi\,d\eta\,dx'\,dy' \qquad (9)$$

where

$$r = \sqrt{\xi^2 + \eta^2}$$

By changing order of integration, the radiation impedance can be expressed as follows:

$$Z_r = \frac{i2\omega\sigma}{\pi} \int_0^{L_y}\int_0^{L_x}\int_\eta^{L_y}\int_\xi^{L_x} \frac{e^{-ik\sqrt{\xi^2+\eta^2}}}{\sqrt{\xi^2+\eta^2}}\, dx'dy'd\xi\, d\eta \qquad (10)$$

or, upon integration with respect to x' and y',

$$Z_r = \frac{i2\omega\sigma}{\pi} \int_0^{L_y}\int_0^{L_x} \frac{(L_x-\xi)(L_y-\eta)\, e^{-ik\sqrt{\xi^2+\eta^2}}}{\sqrt{\xi^2+\eta^2}}\, d\xi\, d\eta \qquad (11)$$

It is of interest to note that Eq. (11) can be written in generalized form. The normalizing factors used are:

$$L_y/L_x = \zeta \qquad L_x k = \gamma \qquad \eta/L_x = v \qquad \xi/L_x = u \qquad (12)$$

Thus in generalized form, Eq. (11) becomes

$$Z_r = \frac{i2\omega\sigma L_x^3}{\pi} \int_0^{\zeta}\int_0^{1} \frac{(1-u)(\zeta - v)\, e^{-i\gamma\sqrt{u^2+v^2}}}{\sqrt{u^2+v^2}}\, du\, dv \qquad (13)$$

It is now necessary to change from rectangular to cylindrical coordinates in order to perform the indicated integration. From Fig. 1b, for the lower triangle,

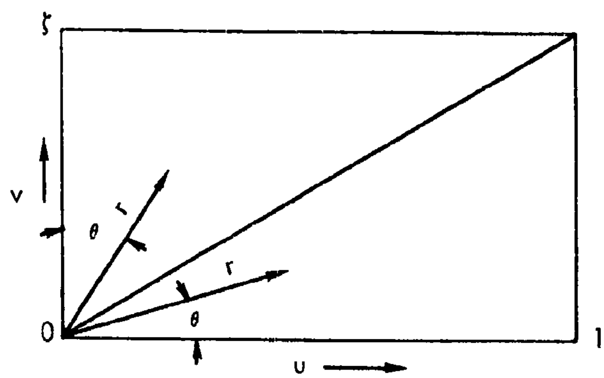


FIGURE 1b.
COORDINATE SYSTEM USED FOR TRANSFORMATION TO CYLINDRICAL COORDINATES

$$r \cos\theta = u, \qquad r \sin\theta = v \tag{14}$$

and for the upper triangle,

$$r \sin\theta = u \qquad r \cos\theta = v \tag{15}$$

From the Jacobian Transformation,

$$du\,dv = r\,dr\,d\theta \tag{16}$$

Therefore, the impedance equation in cylindrical coordinates is,

$$Z_r = \frac{i2\omega\sigma L_x^3}{\pi} \int_0^{\tan^{-1}\zeta} \int_0^{\sec\theta} (1 - r\cos\theta)(\zeta - r\sin\theta)\, e^{-i\gamma r}\, dr\, d\theta$$

$$+ \frac{i2\omega\sigma L_x^3}{\pi} \int_0^{\cot^{-1}\zeta} \int_0^{\zeta\sec\theta} (1 - r\sin\theta)(\zeta - r\cos\theta)\, e^{-i\gamma r}\, dr\, d\theta \tag{17}$$

Integrating Eq. (17) with respect to r, the expression for radiation impedance in terms of an integral with respect to the variable θ becomes

$$Z_r = -\frac{i2\omega\sigma L_x^3}{\pi}\left[\frac{\zeta}{\gamma^2}\int_0^{\tan^{-1}\zeta} \cos\theta\, e^{-i\gamma\sec\theta}\, d\theta + \frac{1}{\gamma^2}\int_0^{\cot^{-1}\zeta} \cos\theta\, e^{-i\zeta\gamma\sec\theta}\, d\theta\right.$$

$$\left. - \frac{i}{\gamma^3}\left(e^{-i\gamma\sqrt{1+\zeta^2}} - e^{-i\gamma} - e^{-i\zeta\gamma} + 1 - \frac{\pi\zeta\gamma^2}{2} - i\gamma(1+\zeta)\right)\right] \tag{18}$$

For convenience of calculation, it is necessary to express Eq. (18) in terms of its real and imaginary components. Also, it is desirable to express the impedance as a unit, or characteristic impedance, therefore Eq. (18) is divided by the piston area $(L_x\, L_y)$. The characteristic radiation impedance z_r, is therefore,

$$z_r = c\sigma(R + iX) \tag{19}$$

with R the radiation resistance and X the radiation reactance.

$$R = \frac{2}{\pi\gamma}\left[\int_0^{\tan^{-1}\zeta} \cos\theta \sin(\gamma \sec\theta)\, d\theta + \frac{1}{\zeta}\int_0^{\cot^{-1}\zeta} \cos\theta \sin(\zeta\gamma \sec\theta)\, d\theta \right.$$

$$\left. + \frac{1}{\zeta\gamma}\left(\cos\left(\gamma\sqrt{1+\zeta^2}\right) - \cos\gamma - \cos\zeta\gamma + 1 - \frac{\pi\zeta\gamma^2}{2}\right)\right] \tag{20}$$

$$X = -\frac{2}{\pi\gamma}\left[\int_0^{\tan^{-1}\zeta} \cos\theta \cos(\gamma \sec\theta)\, d\theta + \frac{1}{\zeta}\int_0^{\cot^{-1}\zeta} \cos\theta \cos(\zeta\gamma \sec\theta)\, d\theta \right.$$

$$\left. - \frac{1}{\zeta\gamma}\left(\sin\left(\gamma\sqrt{1+\zeta^2}\right) - \sin\gamma - \sin\zeta\gamma + \gamma(1+\zeta)\right)\right] \tag{21}$$

The above equations for R and X could be written in terms of a series as was done in Ref. 2, but in the present case this would not result in any simplicity of calculation, since a digital computer was used in obtaining numerical results.

2. MOVING MEDIUM

In the preceding section, the radiation impedance for a cavity in a stationary medium has been derived. It is now necessary to include the effects of a moving medium in the theory. Garrick (Ref. 6) shows how retarded potential theory can be used for including the effects of a moving medium.

a. Subsonic Velocities

For the case of a simple source in a moving medium of uniform subsonic velocity u_f ($u_f < c$), the wave equation for small pressure disturbances is

$$\nabla^2 p_p = \frac{1}{c^2}\left(\frac{\partial}{\partial t} + u_f \frac{\partial}{\partial x}\right)^2 p_p \tag{22}$$

The solution of Eq. (22) for the differential pressure at a field point (x', y') from a simple source at (x, y) is as follows:

$$dp_p = i\omega\sigma u_p \frac{e^{i\omega t}\, e^{-(ik/\beta^2)\left[-M(x'-x) + D\right]}}{2\pi D}\, dx\, dy \tag{23}$$

where

$$\beta^2 = 1 - M^2 \qquad D = \sqrt{(x'-x)^2 + \beta^2(y'-y)^2} \tag{24}$$

Using Eqs. (1) and (2) from the preceding section and the result of Eq. (23), the impedance for a vibrating piston of air radiating into a subsonic flow is

$$Z_r = \frac{i\omega\sigma}{2\pi} \int_0^{L_y}\int_0^{L_x}\int_0^{L_y}\int_0^{L_x} \frac{e^{(-ik/\beta^2)\left[-M(x'-x) + D\right]}}{D}\, dx\, dy\, dx'\, dy' \tag{25}$$

Upon separating the above equation for Z_r into four equal integrals as was done in Eq. (6), the radiation impedance has the following form:

$$Z_r = \frac{i\omega\sigma}{\pi}\int_0^{L_y}\int_0^{L_x}\int_0^{y'}\int_0^{x'} \left[\frac{e^{-ik\left[D + M(x' - x)\right]/\beta^2}}{D} + \frac{e^{-ik\left[D - M(x' - x)\right]/\beta^2}}{D}\right] dx\, dy\, dx'\, dy' \tag{26}$$

It is now convenient to make the following changes of variables of integration,

$$x' - x = \xi \qquad \beta(y' - y) = \eta \tag{27}$$

After substitution of the changes of variables, and an inter-change of the order of integration, the radiation impedance, after integration with respect to dx', dy', can be written in the following integral form:

$$Z_r = \frac{i\omega\sigma}{\pi\beta^2}\int_0^{\beta L_y}\int_0^{L_x}(L_x - \xi)(\beta L_y - \eta)\left[\frac{e^{-ik\left[M\xi - \sqrt{\xi^2+\eta^2}\right]/\beta^2}}{\sqrt{\xi^2+\eta^2}} + \frac{e^{-ik\left[M\xi + \sqrt{\xi^2+\eta^2}\right]/\beta^2}}{\sqrt{\xi^2+\eta^2}}\right] d\xi\, d\eta \tag{28}$$

Since a generalized solution for any Mach number, cavity length, and cavity width is desired, it is convenient at this point in the derivation to make the normalizing substitutions of Eq. (12) again. The generalized equation for impedance then can be written in the following double integral form:

$$Z_r = \frac{i\omega\sigma L_x^3}{\pi\beta^2}\int_0^{\beta\zeta}\int_0^{1}(1 - u)(\beta\zeta - v)\left[\frac{e^{-ik\left[\sqrt{u^2+v^2} + Mu\right]/\beta^2}}{\sqrt{u^2+v^2}} + \frac{e^{-ik\left[\sqrt{u^2+v^2} - Mu\right]/\beta^2}}{\sqrt{u^2+v^2}}\right] du\, dv \tag{29}$$

In order to reduce Eq. (29) to single integral form, it is necessary to make the transformation to cylindrical coordinates, as indicated in Eqs. (14), (15), and (16). The normalized impedance equation in cylindrical coordinates is then:

$$
\begin{aligned}
Z_r = {} & \frac{i\omega\sigma L_x^3}{\pi\beta^2}\int_0^{\tan^{-1}\beta\zeta}\int_0^{\sec\theta}\Big[(1-D\cos\theta)(\beta\zeta-D\sin\theta)e^{-i\gamma(1+M\cos\theta)D/\beta^2} \\
& \qquad + (1-D\cos\theta)(\beta\zeta-D\sin\theta)e^{-i\gamma(1-M\cos\theta)D/\beta^2}\Big]dD\,d\theta \\
& + \frac{i\omega\sigma L_x^3}{\pi\beta^2}\int_0^{\cot^{-1}\beta\zeta}\int_0^{\beta\zeta\sec\theta}\Big[(1-D\sin\theta)(\beta\zeta-D\cos\theta)e^{-i\gamma(1+M\sin\theta)D/\beta^2} \\
& \qquad + (1-D\sin\theta)(\beta\zeta-D\cos\theta)e^{-i\gamma(1-M\sin\theta)D/\beta^2}\Big]dD\,d\theta
\end{aligned}
\tag{30}
$$

Upon integrating Eq. (30) with respect to D, and separating into its real and imaginary components in the form of Eq. (19), the characteristic radiation resistance for the subsonic flow case is:

$$
\begin{aligned}
R = -\frac{\beta^3}{\pi\gamma}\Bigg[& \int_0^{\tan^{-1}\beta\zeta}\left[\frac{\sec\theta\,\sin\left[\gamma(\sec\theta+M)/\beta^2\right]}{(\sec\theta+M)^2}+\frac{\sec\theta\,\sin\left[\gamma(\sec\theta-M)/\beta^2\right]}{(\sec\theta-M)^2}\right]d\theta \\
& -\int_0^{\cot^{-1}\beta\zeta}\left[\sin\theta-\frac{\cos\theta}{\beta\zeta}\right]\left[\frac{\sin\left[\gamma\zeta\sec\theta(1+M\sin\theta)/\beta\right]}{(1+M\sin\theta)^2}+\frac{\sin\left[\gamma\zeta\sec\theta(1-M\sin\theta)/\beta\right]}{(1-M\sin\theta)^2}\right]d\theta \\
& -\int_0^{\cot^{-1}\beta\zeta}\frac{2\beta\sin\theta\cos\theta}{\gamma\zeta}\left[\frac{\cos\left[\gamma\zeta\sec\theta(1+M\sin\theta)/\beta\right]}{(1+M\sin\theta)^3}+\frac{\cos\left[\gamma\zeta\sec\theta(1-M\sin\theta)/\beta\right]}{(1-M\sin\theta)^3}\right]d\theta \\
& +\frac{\beta}{\gamma\zeta}\left[\frac{\cos\left[\gamma(\sqrt{1+(\beta\zeta)^2}+M)/\beta^2\right]}{(\sqrt{1+(\beta\zeta)^2}+M)^2}+\frac{\cos\left[\gamma(\sqrt{1+(\beta\zeta)^2}-M)/\beta^2\right]}{(\sqrt{1+(\beta\zeta)^2}-M)^2}\right]\Bigg]
\end{aligned}
\tag{31}
$$

$$- \frac{\beta}{\gamma\zeta}\left[\frac{\cos\left[\gamma(1+M)/\beta^2\right]}{(1+M)^2} + \frac{\cos\left[\gamma(1-M)/\beta^2\right]}{(1-M)^2}\right] + \frac{\beta}{\gamma\zeta}\left[\frac{1}{(1+M)^2} + \frac{1}{(1-M)^2}\right]$$

$$- \frac{2\gamma}{\beta^3}\left[\arctan\left(\frac{1-M}{\beta}\right) + \arctan\left(\frac{1+M}{\beta}\right)\right]\Bigg]$$

And the radiation reactance is,

$$X = \frac{\beta^3}{\pi\gamma}\Bigg[-\int_0^{\tan^{-1}\beta\zeta}\left[\frac{\sec\theta\cos\left[\gamma(\sec\theta+M)/\beta^2\right]}{(\sec\theta+M)^2} + \frac{\sec\theta\cos\left[\gamma(\sec\theta-M)/\beta^2\right]}{(\sec\theta-M)^2}\right]d\theta$$

$$+\int_0^{\cot^{-1}\beta\zeta}\left[\sin\theta - \frac{\cos\theta}{\beta\zeta}\right]\left[\frac{\cos\left[\gamma\zeta\sec\theta(1+M\sin\theta)/\beta\right]}{(1+M\sin\theta)^2} + \frac{\cos\left[\gamma\zeta\sec\theta(1-M\sin\theta)/\beta\right]}{(1-M\sin\theta)^2}\right]d\theta$$

$$-\int_0^{\cot^{-1}\beta\zeta}\frac{2\beta\sin\theta\cos\theta}{\gamma\zeta}\left[\frac{\sin\left[\gamma\zeta\sec\theta(1+M\sin\theta)/\beta\right]}{(1+M\sin\theta)^3} + \frac{\sin\left[\gamma\zeta\sec\theta(1-M\sin\theta)/\beta\right]}{(1-M\sin\theta)^3}\right]d\theta$$

$$+\frac{\beta}{\gamma\zeta}\left[\frac{\sin\left[\gamma(\sqrt{1+(\beta\zeta)^2}+M)/\beta^2\right]}{(\sqrt{1+(\beta\zeta)^2}+M)^2} + \frac{\sin\left[\gamma(\sqrt{1+(\beta\zeta)^2}-M)/\beta^2\right]}{(\sqrt{1+(\beta\zeta)^2}-M)^2}\right] \qquad (32)$$

$$-\frac{\beta}{\gamma\zeta}\left[\frac{\sin\left[\gamma(1+M)/\beta^2\right]}{(1+M)^2} + \frac{\sin\left[\gamma(1-M)/\beta^2\right]}{(1-M)^2}\right] + \frac{1}{\beta\zeta}\left[\frac{1}{1+M} + \frac{1}{1-M}\right] + \frac{2}{\beta^2}$$

$$-\frac{2M}{\beta^3}\left[\arctan\left(\frac{1-M}{\beta}\right) - \arctan\left(\frac{1+M}{\beta}\right)\right]\Bigg]$$

As a matter of interest, the above equations for R and X are equal to Eqs. (20) and (21) if zero Mach number is substituted.

To summarize, equations for radiation resistance and reactance have been developed in terms of three parameters; (1), the ratio of cavity width to length, (2) the normalized frequency parameter, kL_x, and (3) Mach number. Calculations for R and X were performed on a digital computer using numerical integration routines.

b. Supersonic Velocities

The assumptions made in deriving the radiation impedance for a cavity in a supersonic flow are the same as those for subsonic flow except as follows:

(1) The effect of a source at (x, y) is felt only at points (x', y') within the Mach cone with origin at (x, y). The enclosed half-angle, γ, of this cone is $\sin^{-1} 1/M$. Outside the conical region the effect of the source at (x, y) is zero.

(2) The pressure at field point (x', y') has a double solution, instead of the single solution for the subsonic case. The field point, (x', y') at a particular instant of time, t, is influenced by two wave fronts which originated at time t_1 and t_2 earlier. A wave generated at (x, y) at t_1 radiates spherically with velocity of sound c and is carried downstream with supersonic velocity u_f. The spherical wave is therefore traveling downstream at a velocity greater than the speed of sound, so that the field point (x', y') will both enter and leave a particular wave, which is not possible in the subsonic case. Therefore at time t, the field point will be emerging from a wave generated at time t_1 and penetrating a wave front generated at time t_2 $(t > t_2 > t_1)$.

The equation for differential pressure at x', y' with source at x, y is

$$dp = \frac{i\omega\rho u_p e^{i\omega t}}{2\pi}\left(\frac{e^{ik\left[-M(x'-x) - D_s\right]/\beta_s^2} + e^{ik\left[-M(x'-x) + D_s\right]/\beta_s^2}}{D_s}\right) dx\,dy \tag{33}$$

where

$$D_s = \sqrt{(x'-x)^2 - \beta_s^2(y'-y)^2} \qquad \beta_s^2 = M^2 - 1 \tag{34}$$

The next step in deriving the radiation impedance is to determine the limits of integration. It is seen from Fig. 2a that if $\sin\gamma = 1/M$, then $\tan\phi = \sqrt{M^2-1} = \beta_s$. The pressure at (x', y') is the sum of differential pressures received from sources bounded by the Mach cone opening in the negative x direction with origin at (x', y') and the upstream boundarys of the cavity. By examination of Fig. 2a and Fig. 2b it is seen that the integral equation for pressure at a point (x', y') in region I, from sources in the shaded area, will have different limits than the integration for pressure at (x', y') in region II. The dotted line in Figs. 2a and 2b separate region I and II. The angle Δ between the line separating the two

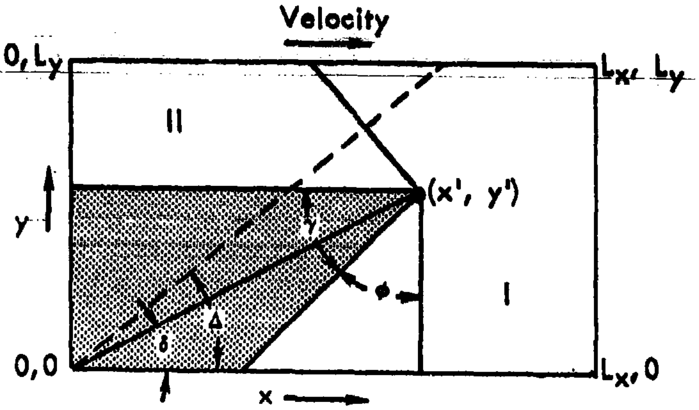


FIGURE 2a.
ILLUSTRATING PRESSURE
POINT (x', y') IN REGION I

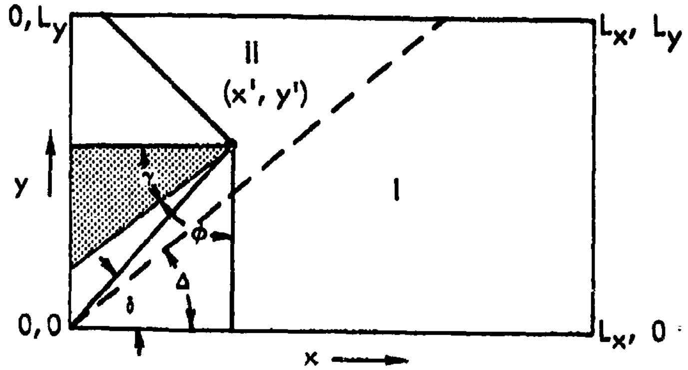


FIGURE 2b.
ILLUSTRATING PRESSURE
POINT (x', y') IN REGION II

regions and the x axis is defined by

$$\Delta = \tan^{-1}\left(\frac{1}{\sqrt{M^2 - 1}}\right) = \tan^{-1}(1/\beta_s)$$

and the angle δ, separating the radial vector from 0 to (x', y') and the x axis is defined by

$$\delta = \tan^{-1}(y'/x')$$

Therefore if $\delta < \Delta$, the point (x', y') is in region I and if $\delta > \Delta$, (x', y') is in region II.

The pressure at (x', y') for (x', y') in region I, using Fig. 3a, is as follows. The limits for the x integration, holding y constant, will be from 0 to the intersection point of the Mach cone along the x axis which is

$$x' - (y' - y)\tan\phi = x' - (y' - y)\beta_s$$

The y limits for the shaded area called region A are from 0 to y'. Therefore the pressure at (x', y') is

$$p(x',y') = \int_0^{y'} \int_0^{[x' - (y' - y)\beta_s]} (dp)$$

The x limits of integration in region II from inspection of Fig. 3b are as in the previous integration 0 to $x' - (y'-y)\beta_s$. In setting up the y limits it is necessary to find the point of intersection with the y axis of the lower part of the Mach cone. This point is $y' - x'/\tan \Phi = y'-x'/\beta_s$. Then the y limits are $y' - x'/\beta_s$ to y'. Therefore the pressure contributed to (x', y') from the shaded region of Fig. 3b is

$$p(x',y') = \int_{y' - x'/\beta_s}^{y'} \int_0^{x' - (y' - y)\beta_s} (dp)$$

FIGURE 3a.
ILLUSTRATING LIMITS OF INTEGRATION FOR THE SUPERSONIC PRESSURE EQUATION

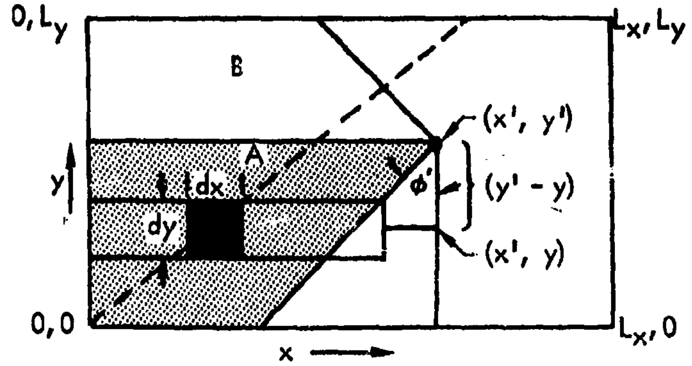
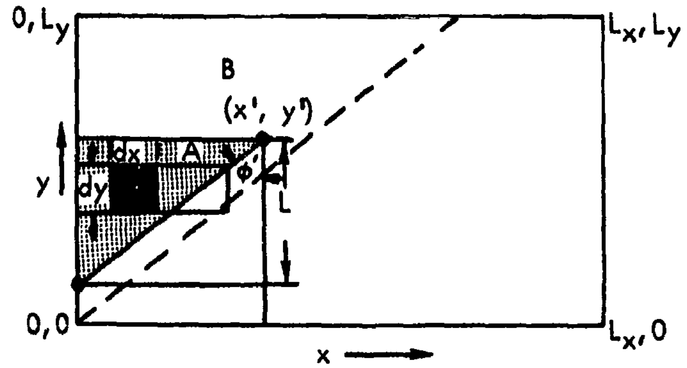


FIGURE 3b.
ILLUSTRATING LIMITS OF INTEGRATION FOR THE SUPERSONIC PRESSURE EQUATION



As in the preceding impedance derivations, once the pressure at point (x', y') is known, the force on the piston can be calculated. However, in the case now under consideration there are some problems. Regions I and II defined in the derivation of pressure each may have two different geometric shapes as seen in Figs. 4a and 4b. In Fig. 4a $\Delta > \tan^{-1}(L_y/L_x)$ or $1/\beta_s > (L_y/L_x)$ and in Fig. 4b. $\Delta < \tan^{-1}(L_y/L_x)$ or $1/\beta_s < L_y/L_x$.

FIGURE 4a.
SHOWING LIMITS OF INTEGRATION FOR THE SUPERSONIC FORCE INTEGRAL

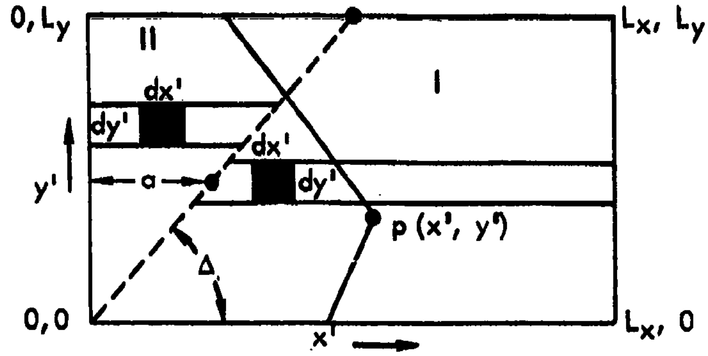
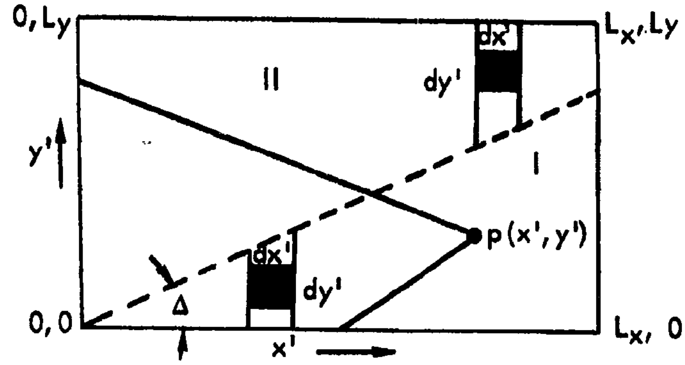


FIGURE 4b.
SHOWING LIMITS OF INTEGRATION FOR THE SUPERSONIC FORCE INTEGRAL



First, the force on area $L_x L_y$ will be derived for $\Delta \geq \tan^{-1}(L_y/L_x)$. In region I, the x' limits of integration are from a to L_x where $a = y'/\tan\Delta = y'\beta_s$ and the y' limits are 0 to L_y. For region II the x' limits of integration are 0 to $a = y'\beta_s$ and the y' limits are 0 to L_y. Using these limits, the force integral is

$$F = \int_0^{L_y}\int_{y'\beta_s}^{L_x} p_p(\text{region I})\, dx'dy' + \int_0^{L_y}\int_0^{y'\beta_s} p_p(\text{region II})\, dx'dy'$$

or, noting that the force from region B is equal to the force from region A when integrating pressure over the total area $L_x L_y$, with respect to dx', dy', the force is

$$F = 2\int_0^{L_y}\int_{y'\beta_s}^{L_x}\int_0^{y'}\int_0^{x'-(y'-y)\beta_s}(dp_p)\,dx\,dy\,dx'dy'$$

$$+\,2\int_0^{L_y}\int_0^{y'\beta_s}\int_{y'-x'/\beta_s}^{y'}\int_0^{x'-(y'-y)\beta_s}(dp_p)\,dx\,dy\,dx'dy' \qquad (35)$$

For $\Delta \leq \tan^{-1}(L_x/L_y)$ or $(\beta_s L_y/L_x) \geq 1$ the order of integration for force is reversed to $dy'\,dx'$. For region I, from Figure 4b, the y limits are 0 to $x' \tan \Delta = x'/\beta_s$, and x' limits are 0 to L_x. In region II, y' limits are x'/β_s to L_y and x' limits are 0 to L_x. Using these limits the force is

$$F = \int_0^{L_x}\int_0^{x'/\beta_s} p_p(\text{region I})\,dy'dx' + \int_0^{L_x}\int_{x'/\beta_s}^{L_y} p_p(\text{region II})\,dy'dx'$$

or substituting in the expressions for

$$F = \int_0^{L_x}\int_0^{x'/\beta_s}\int_0^{y'}\int_0^{x'-(y'-y)\beta_s}(dp_p)\,dx\,dy\,dy'dx'$$

$$+\int_0^{L_x}\int_{x'/\beta_s}^{L_y}\int_{y'-x'/\beta_s}^{y'}\int_0^{x'-(y'-y)\beta_s}(dp_p)\,dx\,dy\,dy'dx' \qquad (36)$$

Now that the limits of integration have been established the radiation impedance Z_r can be set up and solved.

The first case to be integrated is for $\beta_s L_y/L_x \leq 1$. Substituting Eqs. (34) in Eq. (35) the radiation impedance equation is

$$Z_r = \frac{i\omega\sigma}{\pi}\int_0^{L_y}\int_{y'\beta_s}^{L_x}\int_0^{y'}\int_0^{x'-(y'-y)\beta_s} F(x,y,x',y')\,dx\,dy\,dx'dy'$$

$$+\,\frac{i\omega\sigma}{\pi}\int_0^{L_y}\int_0^{y'\beta_s}\int_{y'-x'/\beta_s}^{y'}\int_0^{x'-(y'-y)\beta_s} F(x,y,x',y')\,dx\,dy\,dx'dy' \qquad (37)$$

where

$$F(x,y,x',y') = (1/D_s)\left[e^{ik\left[-M(x'-x) - D_s\right]/\beta_s^2} + e^{ik\left[-M(x'-x) + D_s\right]/\beta_s^2}\right]$$

By changing variables, the function F (x, y, x', y') can be made dependent upon two variables instead of four as stated above. The following indicated changes are therefore made:

$$x' - x = \xi \qquad \beta_s(y' - y) = \eta$$

Then (38)

$$F(\xi,\eta) = (1/D_s)\left[e^{ik(M\xi + D_s)/\beta_s^2} + e^{-ik(M\xi - D_s)/\beta_s^2}\right]$$

where

$$D_s = \sqrt{\xi^2 - \eta^2}$$

and changing limits in Eq. (37), the resulting equation for Z_r is

$$Z_r = \frac{i\omega\sigma}{\pi\beta_s}\int_0^{L_y}\int_{\beta_s y'}^{L_x}\int_0^{\beta_s y'}\int_{\eta}^{x'} F(\xi,\eta)\, d\xi\, d\eta\, dx'dy'$$

$$+ \frac{i\omega\sigma}{\pi\beta_s}\int_0^{L_y}\int_0^{\beta_s y'}\int_0^{x'}\int_{\eta}^{x'} F(\xi,\eta)\, d\xi\, d\eta\, dx'dy' \qquad (39)$$

Upon interchanging the order of integration, the above equation for Z_r is

$$Z_r = \frac{i\omega\sigma}{\pi\beta_s^2}\int_0^{\beta_s L_y}\int_{\eta}^{L_x}\int_{\eta}^{\beta_s L_y}\int_{\xi}^{L_x} F(\xi,\eta)\, dx'dy'd\xi\, d\eta \qquad (40)$$

After integration with respect to x' and y', Eq. (40) reduces to

$$Z_r = \frac{i\omega\sigma}{\pi\beta_s^2} \int_0^{\beta_s L_y} \int_\eta^{L_x} (L_x - \xi)(\beta_s L_y - \eta)\ F(\xi,\eta)\ d\xi\ d\eta \qquad (41)$$

The next step in solving for supersonic impedance is to use the normalizing factors of Eq. (12), requiring the following form:

$$Z_r = \frac{i\omega\sigma L_x^3}{\pi\beta_s^2} \int_0^{\beta_s \zeta} \int_v^{1} (1 - u)(\beta_s \zeta - v)\ F(u,v)\ du\ dv \qquad (42)$$

where

$$F(u,v) = \left(1/\sqrt{u^2 - v^2}\right)\left(e^{-i\gamma(Mu + \sqrt{u^2 - v^2})/\beta_s^2} + e^{-i\gamma(Mu - \sqrt{u^2 - v^2})/\beta_s^2}\right)$$

In order to simplify the above equation, another change of variables must be incorporated. Let $D_s = \sqrt{u^2 - v^2}$ and $\sin\theta = v/u$. Using Jacobian transformations,

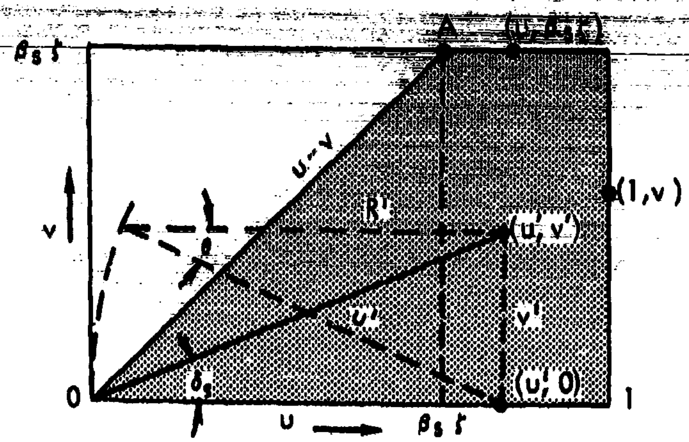
$$du\ dv = D_s \sec\theta\ dD_s\ d\theta \qquad (43)$$

Solving the above relationships for u and v it is seen that

$$u = D_s \sec\theta \qquad v = D_s \tan\theta \qquad (44)$$

From Fig. 5, the area of integration is bounded by (0, 1, $\beta_s\zeta$, A). For simplicity the angle δ_s is used in setting limits. The integration is to be divided into two triangles, one bounded by (0, 1, $\beta_s\zeta$) and the other bounded by (0, $\beta_s\zeta$, A). In the lower triangle the limits on δ_s are from 0 to $\tan^{-1}(\beta_s\zeta)$. The variable $D_s = \sqrt{u^2 - v^2}$ can be visualized by rotating the vector u' about the point (u', 0) until it intersects a line parallel to the u-axis that also intersects the point (u', v'). The variable D_s is the distance between (u', v') and the intersection of the vector u' with the parallel. The relationship between θ and δ_s is $\sin\theta = (v'/u') = \tan(\delta_s)$. When a point (u = 1, v) is considered $\tan\delta_s = v = \sin\theta$. With the relationship $D_s = \sqrt{u^2 - v^2}$ the upper limit for D_s is $\sqrt{1-\sin^2\theta} = \cos\theta$ and the lower limit is 0. The upper limit for θ is $\theta = \sin^{-1}(v/u) = \sin^{-1}(\beta_s\zeta)$.

FIGURE 5.
ILLUSTRATING CHANGE FROM RECTANGULAR TO CYLINDRICAL COORDINATES FOR SUPERSONIC IMPEDANCE INTEGRAL



For the upper triangle, δ_s varies from $\tan^{-1}(\beta_s\zeta)$ to $\pi/4$. When the point $(u,\ v = \beta_s\zeta)$ is considered $\tan\delta_s = \beta_s\zeta/u'$ and $D_s = \sqrt{(\beta_s\zeta)^2\cot^2\delta_s - (\beta_s\zeta)^2} = \beta_s\zeta\cot\theta$. Using these limits, the equation for impedance is

$$Z_r = \frac{i\omega\sigma L_x^3}{\pi\rho_s^2}\int_0^{\sin^{-1}\beta_s\zeta}\int_0^{\cos\theta}(\beta_s\zeta - D_s\tan\theta)(1 - D_s\sec\theta)\,F(D_s,\theta)\,dD_s\,d\theta$$

$$+ \frac{i\omega\sigma L_x^3}{\pi\rho_s^2}\int_{\sin^{-1}\beta_s\zeta}^{\pi/2}\int_0^{\beta_s\zeta\cot\theta}(\beta_s\zeta - D_s\tan\theta)(1 - D_s\sec\theta)\,F(D_s,\theta)\,dD_s\,d\theta \tag{45}$$

where

$$F(D_s,\theta) = (\sec\theta)\left(e^{-i\gamma(M\sec\theta + 1)D_s/\beta_s^2} + e^{-i\gamma(M\sec\theta - 1)D_s/\beta_s^2}\right)$$

Integrating Eq. (45) with respect to D_s and separating the real and imaginary parts as was done in Eqs. (32) and (33), for the subsonic medium, the equation for normalized radiation resistance, R , becomes

$$
\begin{aligned}
R = \frac{-\beta_s^2}{\pi\zeta\gamma}\Bigg[\beta_s\zeta\int_0^{\sin^{-1}\beta_s\zeta}&\left(\frac{\sin\left[\gamma(M+\cos\theta)/\beta_s^2\right]\cos\theta}{(M+\cos\theta)^2}+\frac{\sin\left[\gamma(M-\cos\theta)/\beta_s^2\right]\cos\theta}{(M-\cos\theta)^2}\right)d\theta \\
&+\int_{\sin^{-1}\beta_s\zeta}^{\pi/2}\left(\frac{\sin\theta}{(M+\cos\theta)^2}+\frac{\beta_s\zeta\cot\theta\csc\theta}{(M+\cos\theta)}\right)\sin\left[\zeta\gamma(M\csc\theta+\cot\theta)/\beta_s\right]d\theta \\
&+\int_{\sin^{-1}\beta_s\zeta}^{\pi/2}\left(\frac{\sin\theta}{(M-\cos\theta)^2}-\frac{\beta_s\zeta\cot\theta\csc\theta}{(M-\cos\theta)}\right)\sin\left[\zeta\gamma(M\csc\theta-\cot\theta)/\beta_s\right]d\theta \\
&+\frac{\beta_s^2\cos\left[\gamma(M+1)/\beta_s^2\right]}{\gamma(M+1)^2}-\frac{\beta_s^2\cos\left[\gamma(M-1)/\beta_s^2\right]}{\gamma(M-1)^2}+\frac{4M}{\gamma^2}-\frac{\pi\zeta\gamma}{\beta_s^2}\Bigg]
\end{aligned}
\tag{46}
$$

and the normalized radiation reactance is

$$
\begin{aligned}
X = \frac{-\beta_s^2}{\pi\zeta\gamma}\Bigg[\beta_s\zeta\int_0^{\sin^{-1}\beta_s\zeta}&\left(\frac{\cos\left[\gamma(M+\cos\theta)/\beta_s^2\right]}{(M+\cos\theta)^2}+\frac{\cos\left[\gamma(M-\cos\theta)/\beta_s^2\right]}{(M-\cos\theta)^2}\right)\cos\theta\, d\theta \\
&+\int_{\sin^{-1}\beta_s\zeta}^{\pi/2}\left(\frac{\sin\theta}{(M+\cos\theta)^2}+\frac{\beta_s\zeta\cot\theta\csc\theta}{(M+\cos\theta)}\right)\cos\left[\zeta\gamma(M\csc\theta+\cot\theta)/\beta_s\right]d\theta \\
&+\int_{\sin^{-1}\beta_s\zeta}^{\pi/2}\left(\frac{\sin\theta}{(M-\cos\theta)^2}-\frac{\beta_s\zeta\cot\theta\csc\theta}{(M-\cos\theta)}\right)\cos\left[\zeta\gamma(M\csc\theta-\cot\theta)/\beta_s\right]d\theta \\
&-\frac{\beta_s^2\sin\left[\gamma(M+1)/\beta_s^2\right]}{\gamma(M+1)^2}+\frac{\beta_s^2\sin\left[\gamma(M-1)/\beta_s^2\right]}{\gamma(M-1)^2}-\frac{2}{\beta_s^2}+\frac{\pi\zeta M}{\beta_s^2}\Bigg]
\end{aligned}
\tag{47}
$$

From Eq. (36) for $\beta_s \zeta \geq 1$ the equation for radiation impedance is:

$$
\begin{aligned}
Z_r = \frac{i\omega\sigma}{\pi} \int_0^{L_x} \int_0^{x/\beta_s} \int_0^{y'} \int_0^{x'-(y'-y)\beta_s} & F(x,y,x',y')\, dx\, dy\, dx'\, dy' \\
+ \frac{i\omega\sigma}{\pi} \int_0^{L_x} \int_{x/\beta_s}^{L_y} \int_{y'-x/\beta_s}^{y'} \int_0^{x'-(y'-y)\beta_s} & F(x,y,x',y')\, dx\, dy\, dx'\, dy'
\end{aligned}
\qquad (48)
$$

where F (x, y, x', y') is defined in Eq. (37).

Using the substitutions and changes of variables of Eqs. (38) - (45), the equation for the radiation resistance is:

$$
\begin{aligned}
R = -\frac{\beta_s^2}{\pi\zeta\gamma} \Bigg[& \beta_s\zeta \int_0^{\pi/2} \left(\frac{\sin\left[\gamma(M + \cos\theta)/\beta_s^2\right]}{(M + \cos\theta)^2} + \frac{\sin\left[\gamma(M - \cos\theta)/\beta_s^2\right]}{(M - \cos\theta)^2} \right) \cos\theta\, d\theta \\
& + \frac{\beta_s^2 \cos\left[\gamma(M + 1)/\beta_s^2\right]}{\gamma(M + 1)^2} - \frac{\beta_s^2 \cos\left[\gamma(M - 1)/\beta_s^2\right]}{\gamma(M - 1)^2} + \frac{4M}{\gamma^2} - \frac{\pi\zeta\gamma}{\beta_s^2} \Bigg]
\end{aligned}
\qquad (49)
$$

With the formulation for reactance as seen below,

$$
\begin{aligned}
X = -\frac{\beta_s^2}{\pi\zeta\gamma} \Bigg[& \beta_s\zeta \int_0^{\pi/2} \left(\frac{\cos\left[\gamma(M + \cos\theta)/\beta_s^2\right]}{(M + \cos\theta)^2} + \frac{\cos\left[\gamma(M - \cos\theta)/\beta_s^2\right]}{(M - \cos\theta)^2} \right) \cos\theta\, d\theta \\
& - \frac{\beta_s^2 \sin\left[\gamma(M + 1)/\beta_s^2\right]}{\gamma(M + 1)^2} + \frac{\beta_s^2 \sin\left[\gamma(M - 1)/\beta_s^2\right]}{\gamma(M - 1)^2} - \frac{2}{\beta_s^2} - \frac{\pi\zeta M}{\beta_s^2} \Bigg]
\end{aligned}
\qquad (50)
$$

It is of particular interest to note that Eqs. (49) and (50) are equal to Eqs. (46) and (47) if the $\sin^{-1} \beta_s\zeta = \pi/2$. In other words, for $\beta_s\zeta$ greater than 1 the $\sin^{-1} \beta_s\zeta$ is always equal to 90°. This fact is helpful when the impedance is to be calculated using a digital computer.

C. PRESSURE RESPONSE

Experimentally, the results indicate (as will be shown) that for short cavities, or perhaps more inclusively for cavities of length-to-depth ratio of the order of or less than one, the response is almost exclusively in the depth modes. On the other hand, the longer cavities - where $\frac{\text{length}}{\text{depth}} > 1.0$ - show definite experimental evidence of response in the length modes.

Mathematically, it is desirable to effect a general solution which accounts for response in any mode, whether it be length, depth, or transverse. At the same time, it is recognized that a theoretical simplification can be realized if the assumption of a depth-mode predominance is justifiable. Thus the following is concerned with both developments, first the general case and then the simplified case.

1. GENERAL SOLUTION

To effect the general solution, it is hypothesized that the problem comprises one of determining the characteristic response of a rectangular enclosure. The enclosure is assumed to be bounded on five sides by walls of infinite impedance (i.e., rigid walls) and on the sixth by a finite complex impedance which is the radiation impedance determined in the preceding section.

As shown by Morse (Ref. 3), the characteristic response function of the enclosure is

$$\phi_N = \cosh\left(\frac{\pi g_n z}{L_z}\right) \cos\left(\frac{\pi n_y y}{L_y}\right) \cos\left(\frac{\pi n_x x}{L_x}\right) \tag{51}$$

where L_z is the depth of the cavity
L_y is the width of the cavity
L_x is the length of the cavity
n_y, n_x are integers denoting the modes in the y and x directions.

The parameter g_n appears in lieu of n_z because of the finite impedance terminating the cavity at $z = L_z$. It is defined by the following equation.

$$g_n \tanh(\pi g_n) = i\left[\frac{\gamma L_z}{\pi L_x (R + iX)}\right] \tag{52}$$

The solution of Eq. (52) is complex, such that

$$g_n = \xi_n + i\eta_n \tag{53}$$

The roots ξ_n, η_n are calculated from Eq. (52) using iterative methods. Upon separating Eq. (52) into real and imaginary components the following equations are obtained.

$$\cot(\pi\eta_n) = \frac{\eta_n \cosh(\pi\xi_n) - \left[\gamma L_z R/\pi L_x(R^2 + X^2)\right] \sinh(\pi\xi_n)}{\xi_n \sinh(\pi\xi_n) - \left[\gamma L_z X/\pi L_x(R^2 + X^2)\right] \cosh(\pi\xi_n)}$$

$$\cot(\pi\eta_n) = -\frac{\xi_n \cosh(\pi\xi_n) - \left[\gamma L_z X/\pi L_x(R^2 + X^2)\right] \sinh(\pi\xi_n)}{\eta_n \sinh(\pi\xi_n) - \left[\gamma L_z X/\pi L_x(R^2 + X^2)\right] \cosh(\pi\xi_n)} \tag{53a}$$

From the above equations, an expression for η_n in terms of ξ_n can be obtained and is

$$\eta_n = \frac{\gamma L_z R \coth(2\pi\xi_n)}{\pi L_x(R^2 + X^2)} \pm \sqrt{\left[\frac{\gamma L_z R \coth(2\pi\xi_n)}{\pi L_x(R^2 + X^2)}\right]^2 + \frac{2\gamma L_z X \xi_n \coth(2\pi\xi_n)}{\pi L_x(R^2 + X^2)} - \left[\frac{(\gamma L_z/\pi L_x)^2}{(R^2 + X^2)} + \xi_n^2\right]} \tag{53b}$$

Using the first of Eq. (53a) the following form is also derived.

$$F_{\pm} = \cos(\pi\eta_n)\left[\xi_n \sinh(\pi\xi_n) - \left\{\gamma L_z X/\pi L_x(R^2 + X^2)\right\} \cosh(\pi\xi_n)\right]$$

$$- \sin(\pi\eta_n)\left[\eta_n \cosh(\pi\xi_n) - \left\{\gamma L_z R/\pi L_x(R^2 + X^2)\right\} \sinh(\pi\xi_n)\right] \tag{53c}$$

In order to numerically obtain a root from Eqs. (53b) and (53c), a value of ξ_n is chosen and substituted into the equation for η_n. This gives two values for η_n which are used in Eq. (53c) to solve for values of F+ and F−, F+ denoting the results using the positive radical and F− using the negative radical. When a pair of values ξ_n, η_n give a zero value of F± a solution is obtained.

The characteristic frequency equation, in terms of g_n, is (Ref. 3)

$$\omega_N^2 = (\pi c)^2\left[\left(\frac{n_x}{L_x}\right)^2 + \left(\frac{n_y}{L_y}\right)^2 - \left(\frac{g_n}{L_z}\right)^2\right] \tag{54}$$

which yields the resonant frequencies of the cavity by iteration. The iterative process is necessary because of the frequency-dependent nature of g_n.

The magnitude of the response is determined on the premise that the cavity is forced by a simple source positioned randomly over the cavity opening. The equation for pressure at a point (x, y, z,) can then be written, after Morse (Ref. 3), as

$$p_p(x,y,z) = \frac{i\omega\rho^2\sigma e^{-i\omega t}}{V} A(x',y',z') \sum_N \frac{\phi_N(x,y,z)\,\phi_N(x',y',z')}{\lambda_N(\omega^2 - \omega_N^2)} \tag{55}$$

where

$$\lambda_N = \frac{\varepsilon_{n_x}\varepsilon_{n_y}}{16\pi g_n}\left[\sinh(2\pi g_n) + 2\pi g_n\right]$$

$$n_x = 0,\ \varepsilon_{n_x} = 2;\ n_x > 0,\ \varepsilon_{n_x} = 1 \tag{56}$$

$$n_y = 0,\ \varepsilon_{n_y} = 2;\ n_y > 0,\ \varepsilon_{n_y} = 1$$

It is convenient to normalize Eq. (56) for more general results. Thus, let

$$f = \gamma c / 2\pi L_x \tag{57}$$

after which, leaving out the time variations, Eq. (56) can be written in the normalized form

$$p_p(x,y,z) = \frac{i16\pi\rho c\gamma A(x',y',z')}{L_y L_z} \sum_n \sum_{n_y} \sum_{n_x} \left[\frac{g_n \phi_N(x,y,z)\phi_N(x',y',z')}{\varepsilon_{n_x}\varepsilon_{n_y}\left[\sinh(2\pi g_n) + 2\pi g_n\right]}\right] \left[\frac{1}{\gamma^2 - (\pi L_x)^2\left[(n_x/L_x)^2 + (n_y/L_y)^2 - (g_n/L_z)^2\right]}\right] \tag{58}$$

where A (x', y', z') is the strength of the simple source.

2. SIMPLIFIED SOLUTION

If the response of the cavity is entirely that which arises from excitation of depth modes, as the experimental results seem to verify for length-to-depth ratios of less than approximately one, it is more convenient to write the cavity pressure as

$$p = \frac{i p_o \cos\left[(2\pi/\lambda)(L_z - z)\right]}{\zeta_c \sinh(2\pi L_z/\lambda)} \tag{59}$$

where ζ_c is the specific acoustic impedance of the cavity at the open end, and

$$\zeta_c = R + i\left[X - \cot(2\pi L_z/\lambda)\right] \tag{60}$$

Again expressing the amplitude response in terms of an amplification, there results the final equation

$$p/p_o = \left[\left[R \sin(\gamma L_z/L_x)\right]^2 + \left[X \sin(\gamma L_z/L_x) - \cos(\gamma L_z/L_x)\right]^2\right]^{-\frac{1}{2}} \tag{61}$$

III - EXPERIMENTAL TECHNIQUES

A. TEST ARTICLES

1. EXPLORATORY

Exploratory tests were performed in Lockheed's four-inch subsonic supersonic tunnel, shown in Figure 6 schematically. The cavity test article consisted of three interchangeable cavities which were mounted in a specially designed section of the tunnel wall. Cavities of 0.5, 1.0, and 1.5 inch lengths, 1.0 inch width and 1.0 inch depth were used. The cavity floor and tunnel wall 1.0 inch upstream and downstream of the cavity were instrumented with high intensity microphones. Sound data from these were recorded on tape and analyzed for frequency and amplitude content. Static pressure and temperature data were observed from visual indicators. The tests were conducted at subsonic Mach numbers from 0.20 to 0.86 and at a single supersonic Mach number of 3.0.

2. WIND-TUNNEL MODEL

a. General

Supersonic tests were performed in the 40 X 40 inch tunnel at AEDC, Tullahoma, Tennessee, through a range of Mach numbers from 1.75 to 5.0. The model comprised a cylindrical body of revolution having a 15-calibre ogive nose section, and a rectangular recess of variable dimensions located near the front of the cylindrical section, as shown in Figures 7(a), 7(b), & 7(c). Cavities with lengths of .5 to 8.0 inches, depths of 1.0 to 3.5 inches and widths of 2.0 and 4.0 inches were tested. Sound data were obtained with thirteen flush-mounted high-intensity microphones and recorded on tape for subsequent analysis. Figure 8 gives a schematic diagram of the instrumentation used. Static pressure, Mach number, and temperature data were recorded automatically and printed out by a computer. Schlieren movies were taken of the flow in the vicinity of the cavity. Boundary layer profiles along the model exterior surface (90° away from the cavity but at the same longitudinal location as the leading edge of the cavity) were measured with a pressure rake. Further definition of the boundary layer was obtained through a limited number of hot-wire measurements of the longitudinal component of turbulence.

b. Model Mechanism

The variable cavity mechanism made it possible to change cavity size without opening the tunnel repeatedly. The cavity floor was designed to permit depths of 1.0" and 2.5". Motor - controlled slugs allowed any desired cavity length for either depth. A third slug was also provided so that cavities with a depth of 4.5 inches could be tested; however, due to a malfunction shortly before the test, this feature could not be used. Control circuitry was varied during certain phases of the test program so that a wider range of depths could be investigated at 8" cavity length.

Widths of 2.0" and 4.0" were tested over comparable length and depth ranges. The basic mechanism involved the 4" width, with provisions for inserts and a different floor and movable slugs to convert to a 2" width. A remote motor control permitted cavity dimensions to be varied from outside the tunnel. All data cables, tubes and control wires were run through the model sting and then out of tunnel. Microphone and pressure tubes had flexible cabling and tubing to permit movement of the various parts.

B. INSTRUMENTATION AND TEST PROCEDURES

1. SOUND PRESSURE

Sound pressure levels were measured with 13 high intensity Altec BR-180 and BR-200 probe microphones. Ten microphones were mounted in the cavity floor for the 4-inch-width configuration, 2 in the rear wall and one on the model surface 1 inch upstream of the cavity. In the 2-inch-width configuration four microphones were mounted in the floor. Figure 9(a) gives a location diagram for the microphones, and illustrates the mounting procedure used. The probe tip in each installation was isolated from metal-to-metal contact by means of a layer of resilient tape, as indicated in Figure 9(b).

Four of the microphones used were standard Altec-BR-180-3 probe microphones. The remainder were either BR-180-1 or BR-200-1 microphones fitted with probe tubes fabricated for the investigation. These tubes were somewhat shorter than the Altec probe, but were found from comparative laboratory calibrations conducted in a small anechoic chamber to produce satisfactory response characteristics up to 8000 cps. Above that frequency the modified probe in conjunction with the BR-180-1 series of transducers produced a more rapid decrease in sensitivity than the commercial system.

Microphone outputs were carried from the model to decade amplifiers where necessary. The signals then went to a C.E.C. 14 channel recorder, on which half the channels were recorded by frequency-modulation techniques and the remaining half by direct-record techniques. Daily field calibrations of microphones and system were made as a matter of operating routine.

2. STATIC PRESSURE

Static pressures were measured by means of 8 flush-mounted pressure pickups in the cavity floor, 2 pickups in the rear wall, 1 pickup on the model exterior and five pickups in the boundary-layer rake. Locations of the pickups are shown in Figure 9 (a). Actual location of the exterior pickup and the rake was previously described. Pressures were transmitted by steel tubing to C.E.C. electro-dynamic pressure transducers and associated instrumentation. This instrumentation resulted in punched data on a paper tape which was in turn read and printed out by a computer. The computer also calculated and printed out Mach number data from the pressure and temperature data which comprised its input.

3. OPTICAL

High-speed Schlieren movies at 8000 frames per second were made of the flow in the vicinity of the cavity for every condition tested. These movies were taken with a Fastax 16 mm movie camera, modified to take 8 mm exposures in order to achieve the desired frame speed. All photographs were taken with the Schlieren knife edge in the horizontal position. In some cases regular-speed movies were taken from direct views into the cavity, which was coated with ultraviolet sensitive oil. These pictures show flow patterns on the model surface and cavity interiors.

4. DATA REDUCTION

In the 40" by 40" supersonic tests, simultaneous tape recording of all microphones used required only about one minute total tunnel time for a given condition. One

minute was considered the necessary time to obtain a good sample of noise data. Automatic readout and printout of pressure, temperature, and Mach number required only a few seconds. Thus data for a given run was back in the control booth usually in about five minutes. In this way close check was kept on the data for unusual occurrences.

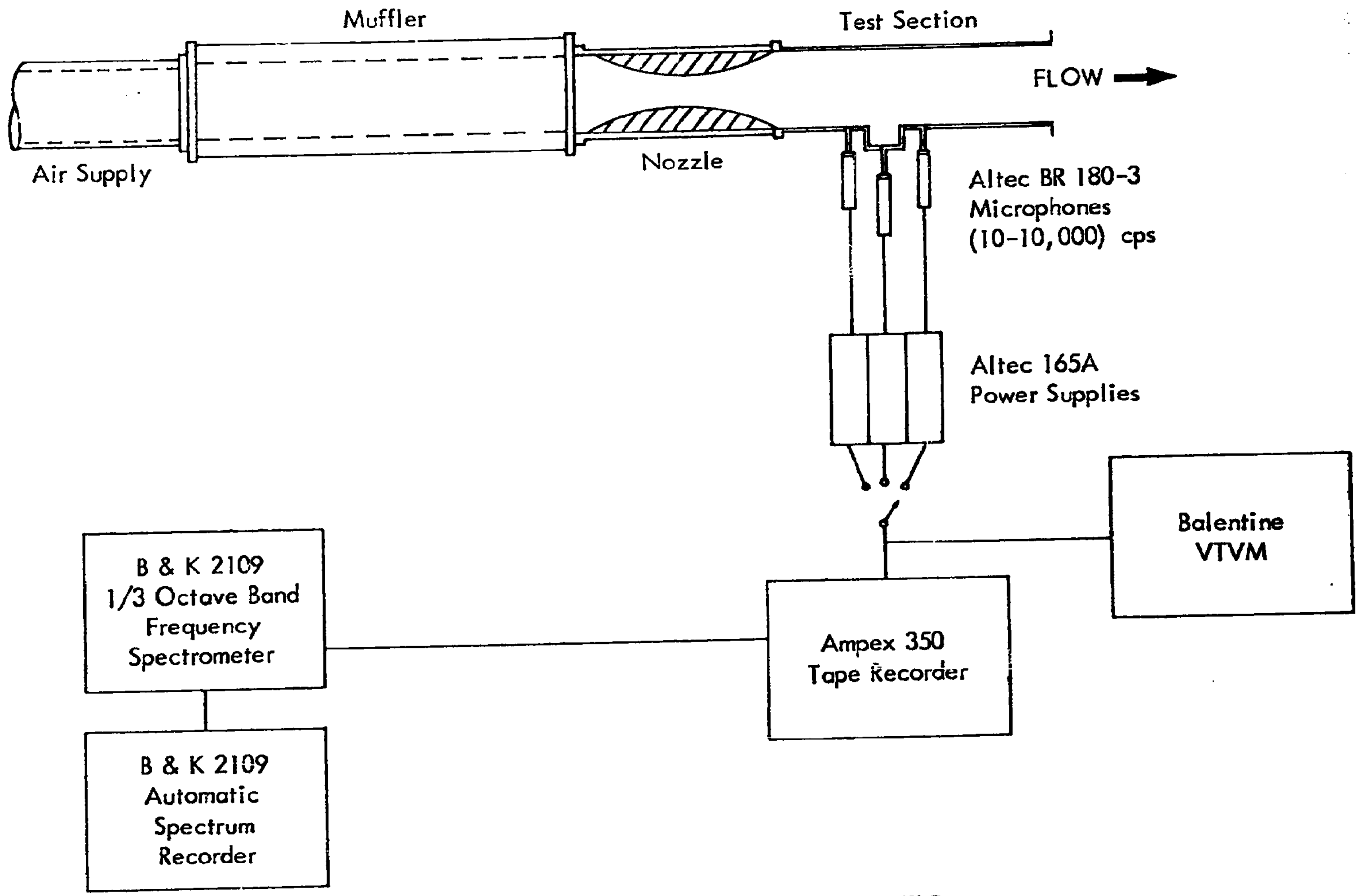


FIGURE 6. EXPLORATORY TEST SCHEMATIC

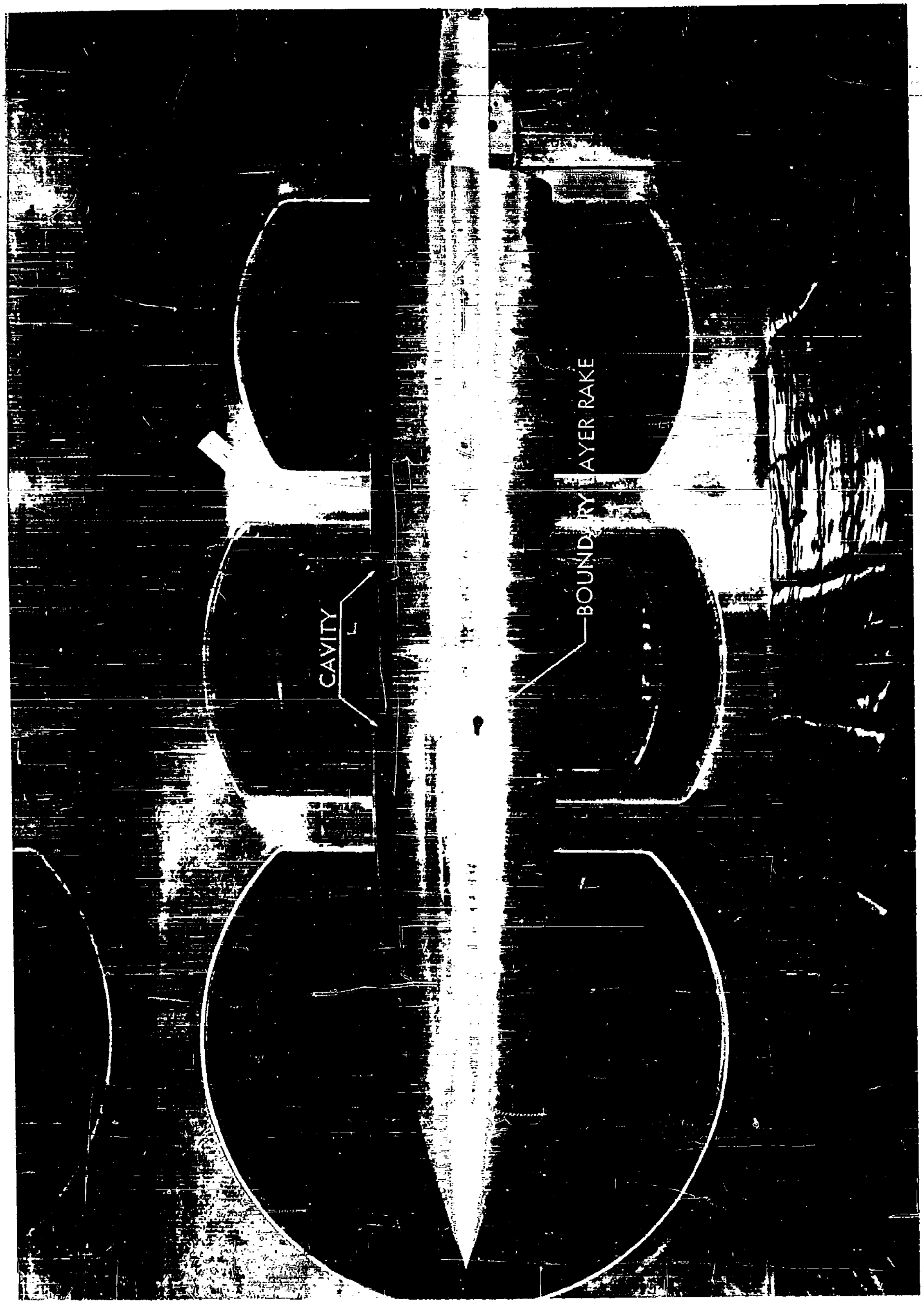


FIGURE 7 (a). AEDC TUNNEL MODEL

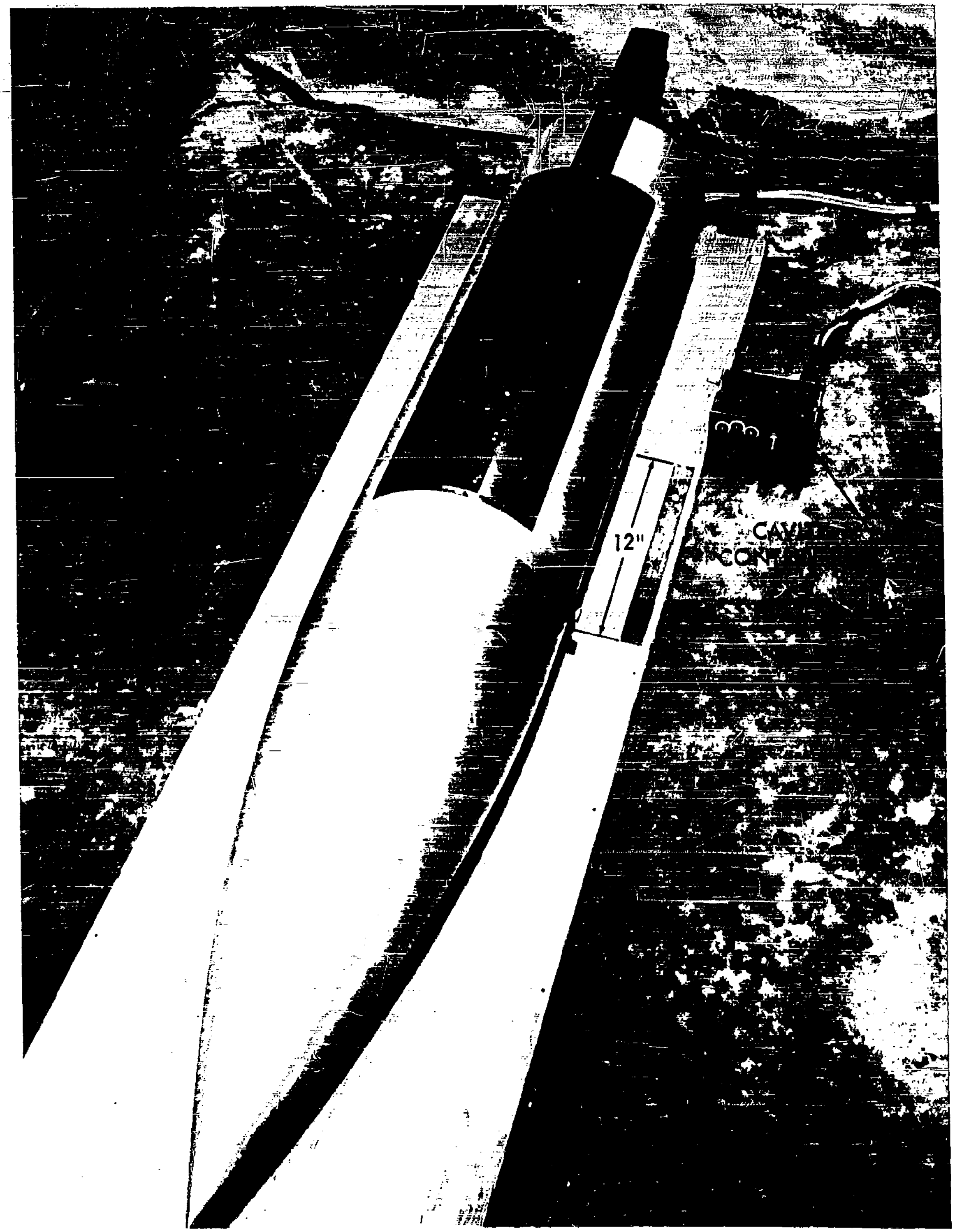


FIGURE 7 (b). MODEL, TOP VIEW

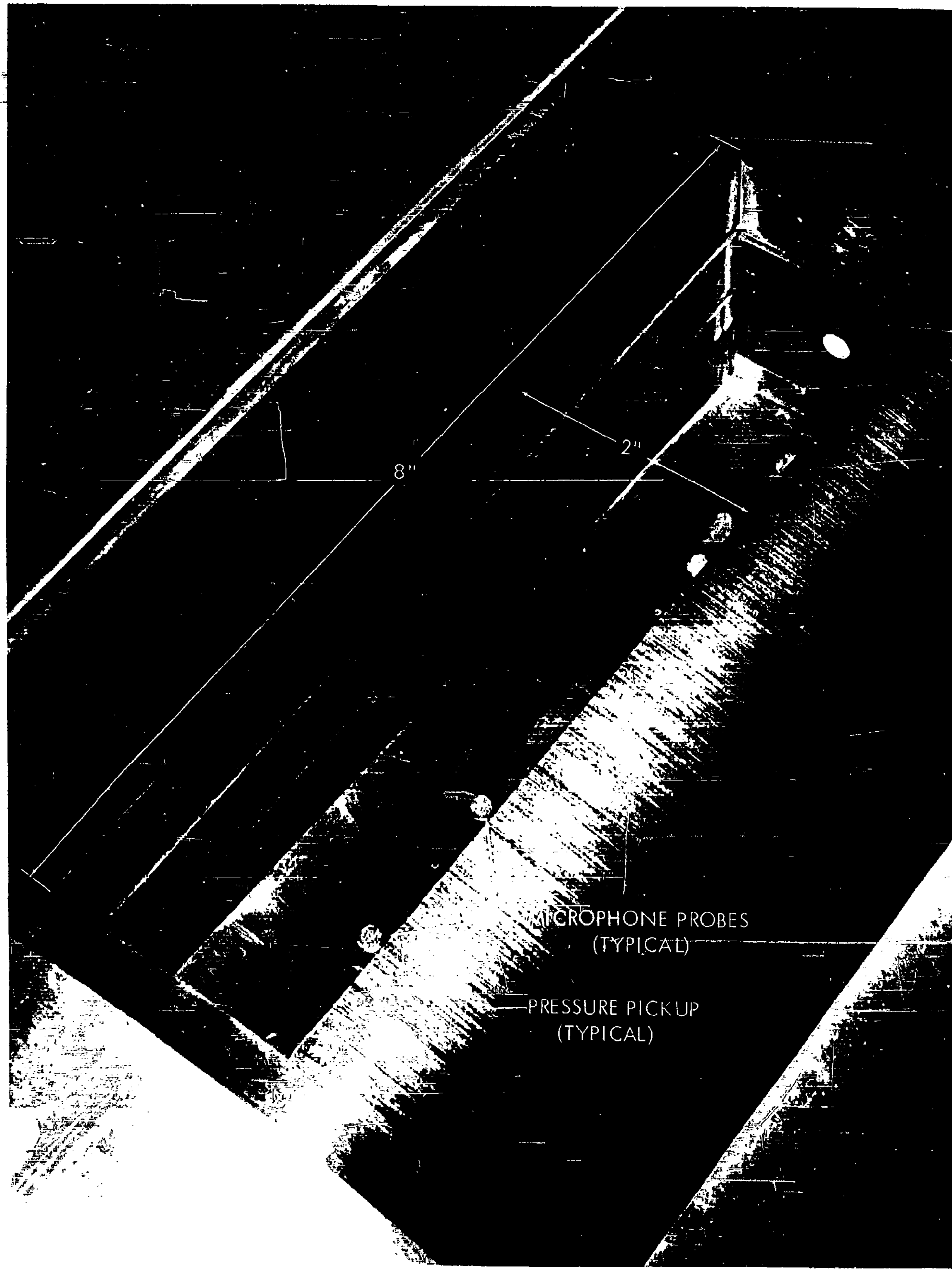


FIGURE 7 (c). CAVITY CONFIGURATION

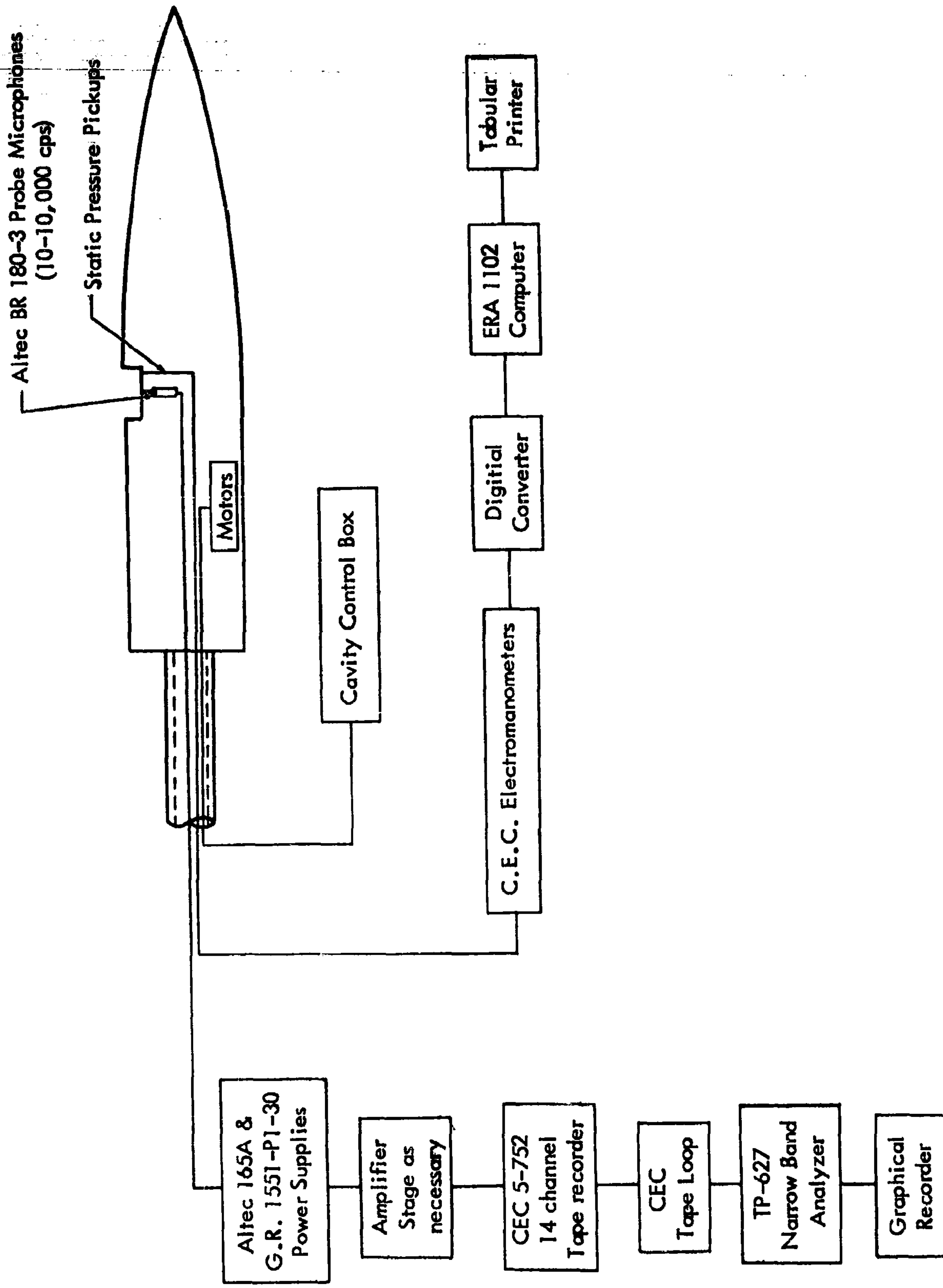


FIGURE 8. INSTRUMENTATION SCHEMATIC - AEDC

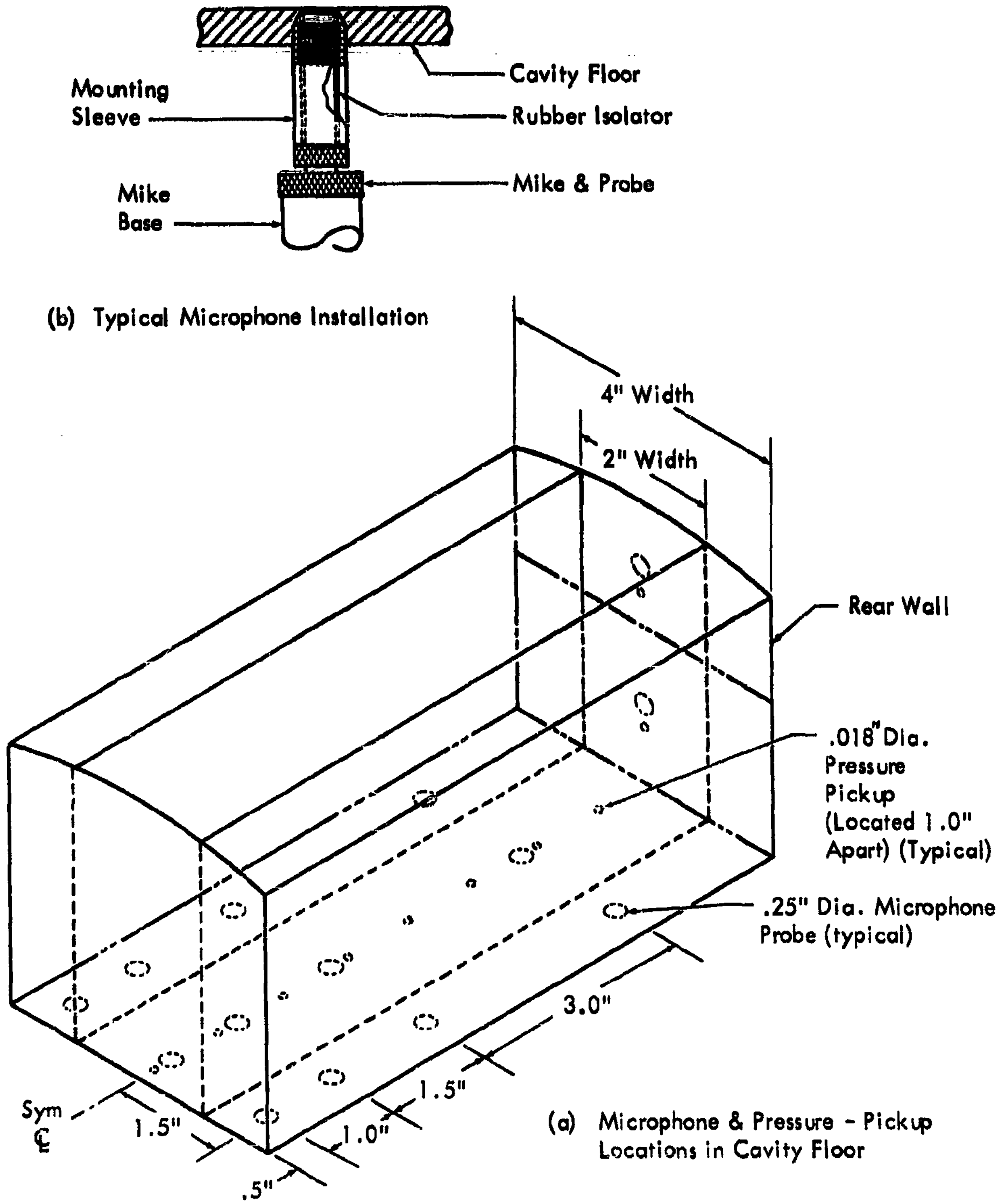


FIGURE 9. TRANSDUCER LOCATIONS AND MOUNTING DETAILS

IV - EXPERIMENTAL RESULTS - EXPLORATORY

In order to gain better insight into the problem of cavity response, a series of exploratory tests was performed with the arrangement shown in Figure 6. Three cavity sizes, comprising lengths of 0.5", 1.0", and 1.5" were tested over a range of subsonic Mach numbers from 0.2 to 0.9 and at a single supersonic Mach number of 3.0. In all cases cavity width and depth were held constant at 1.0". As discussed previously, sound pressure levels were observed at either one or two points in the cavity floor, depending upon cavity length, and at a point 1.0" forward of the cavity in the tunnel wall. As a matter of interest, levels were also observed at a point in the tunnel wall approximately 1.0", downstream of the cavity. Data were recorded on a two-channel tape recorder for later spectral analysis with a 1/3 octave spectrometer.

A. EFFECT OF MACH NUMBER

Figure 10 illustrates the spectra of sound pressure observed in the cavity of 1.0" length at each subsonic Mach number tested. The first clearly-discernible sign of resonant response occured at approximately 0.2 Mach number, at which point the 1/3-octave analyses exhibit a pronounced peak in the spectrum in the vicinity of 2000 cps, and a lesser peak at about 8000 cps. The same peaks appear at a lower level in the upstream spectrum, indicating that radiation from the cavity is taking place.

As Mach number is increased, there is a rapid rise in the sound pressure level associated with the lower mode, such that a maximum level of 152 db occured at Mach 0.665. Further increase of Mach number results in decrease of response in this mode up to the limit of the tests, or Mach 0.86.

It is noted that the same Mach number which maximizes this lower-mode response also represents the clear onset of response in another mode of higher frequency. This response, at approximately 8,500 cps, is visable in the spectrum at all Mach numbers, but is of considerably lower level than that of the lower mode up through a Mach number of 0.665. Above that Mach number, however, a rapid increase in level of this higher-frequency response occurs, such that at Mach 0.835 it is the predominant response, with a SPL of 161 db.

Insofar as the frequency of response is concerned, an increase in Mach number produces an increase in frequency of the lower-mode response, although the proportionality is not a direct one. For example, an increase of Mach number by a factor of approximately 4.0 produces a frequency increase of approximately 60%. The high-frequency mode is noted to change still less with Mach number.

On the basis of these results and some indications of the early, simplified theory (to be discussed subsequently), it was concluded that the response of this particular cavity is more nearly that of acoustic resonance than of any other phenomena.

B. SUPERSONIC FLOW

Figure 11 gives the response spectrum of the configuration just discussed at a Mach number of 3.0. It is interesting to note that essentially the same frequencies characterize this response as characterized the high-subsonic response. The magnitude of the response is quite different, however. The higher mode is not predominant, as it was at 0.835 Mach number; and neither response exceeds 132 db. Of course the static

pressure existing in the cavity is appreciably lower in the supersonic test. The level of the boundary layer noise is also observed to be reduced, but not to nearly the extent that SPL in the cavity is.

C. EFFECT OF LENGTH

The effect of cavity length is illustrated by Figure 12 which shows the spectra obtained from cavities of 0.5", 1.0", 1.5" length at approximately 0.60 Mach number. Certain significant similarities appear. All three cavities, for example, exhibit a peak in the 2700-3200 cps range, which is hypothesized to be the depth mode. The 1.5" cavity appears to involve a more complex response. It contains a very highly predominant peak at 1700 cps which appears in no other case.

In explanation of these results, consider first the simplest calculations of modes of an enclosure of 1.0" width, 1" depth, and lengths of 0.5", 1.0" or 1.5". The characteristic frequency equation is:

$$f_N^2 = \frac{c^2}{4}\left[\left(\frac{n_x}{L_x}\right)^2 + \left(\frac{n_y}{L_y}\right)^2 + \left(\frac{n_z}{L_z}\right)^2\right]$$

From this the primary length and width modes are calculated as shown below:

Configuration	n_x	n_y	n_z	f (cps)
D = 1", W = 1", L = 0.5"	1	0	0	5640
	0	1	0	2820
D = 1", W = 1", L = 1"	1	0	0	2820
	0	1	0	2820
D = 1", W = 1", L = 1.5"	1	0	0	1880
	0	1	0	2820

In addition to the depth modes, it might be expected that the above modes should appear. The 0.5" cavity exhibits none of these frequencies, and its response is assumed to be entirely that of the first two depth modes. Although the 1.0" cavity appears to have essentially the same kind of response, it will be noted that the peak occurs at about 2800 cps instead of 3200 cps, as it does in the 0.5" cavity. This corresponds to both the first length and first width mode as tabulated above and may actually be that mode. The results with the 1.5" length seem to support this since the predominant response is at 1700 cps, which is clearly the frequency of the first length mode. The peak at 5200 cps appears to be the third length mode.

The sound speeds in the AEDC supersonic wind-tunnel for the various test Mach numbers are tabulated below:

MACH NO.	1.5	2.0	2.5	3.0	3.5	4.0	4.5
SPEED OF SOUND, FPS	1160	1152	1160	1162	1182	1185	1205

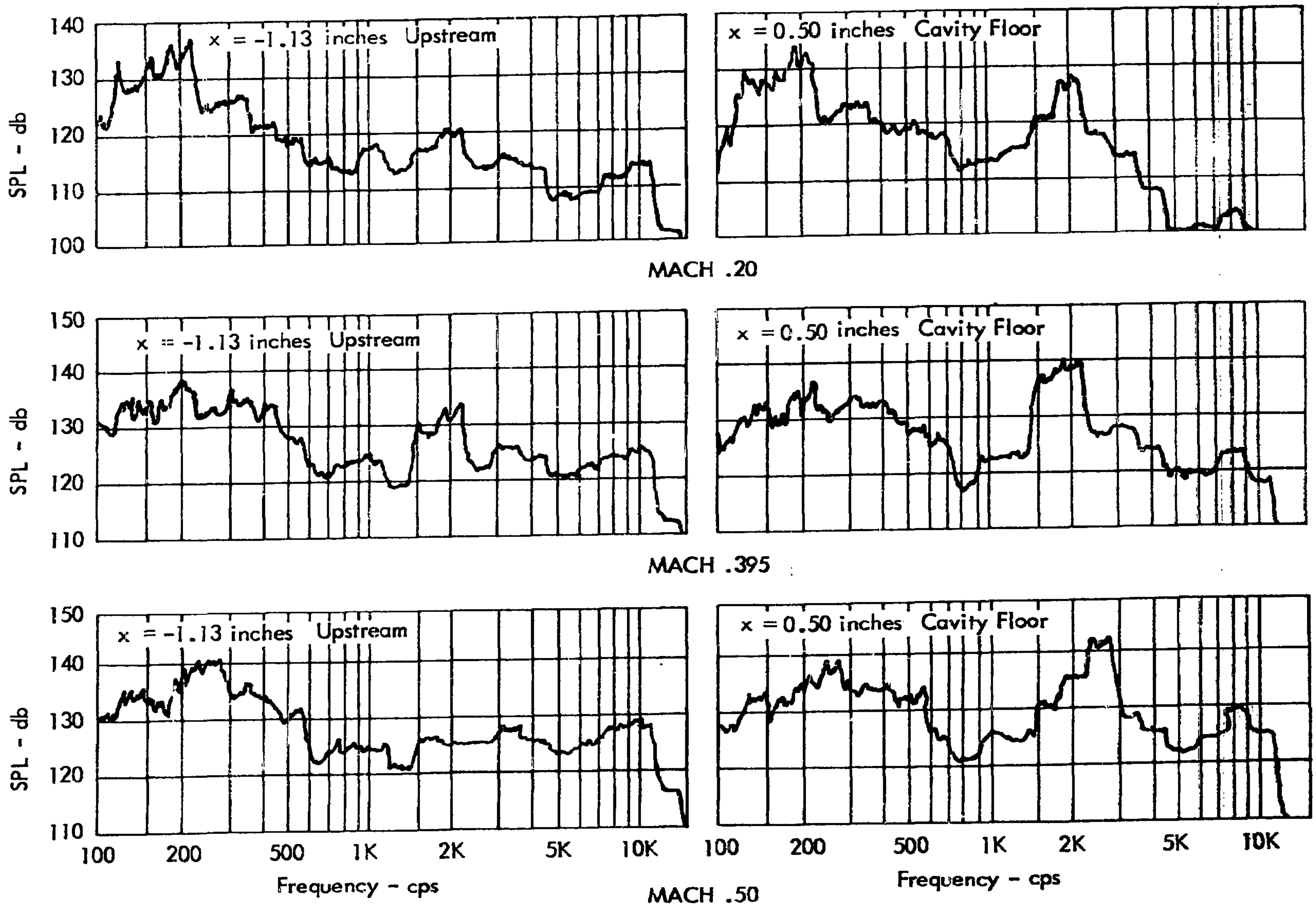


FIGURE 10. SPECTRAL RESPONSE OF A 1" LENGTH X 1" WIDTH X 1" DEPTH CAVITY IN SUBSONIC FLOW
(x = 0 at leading edge of cavity)

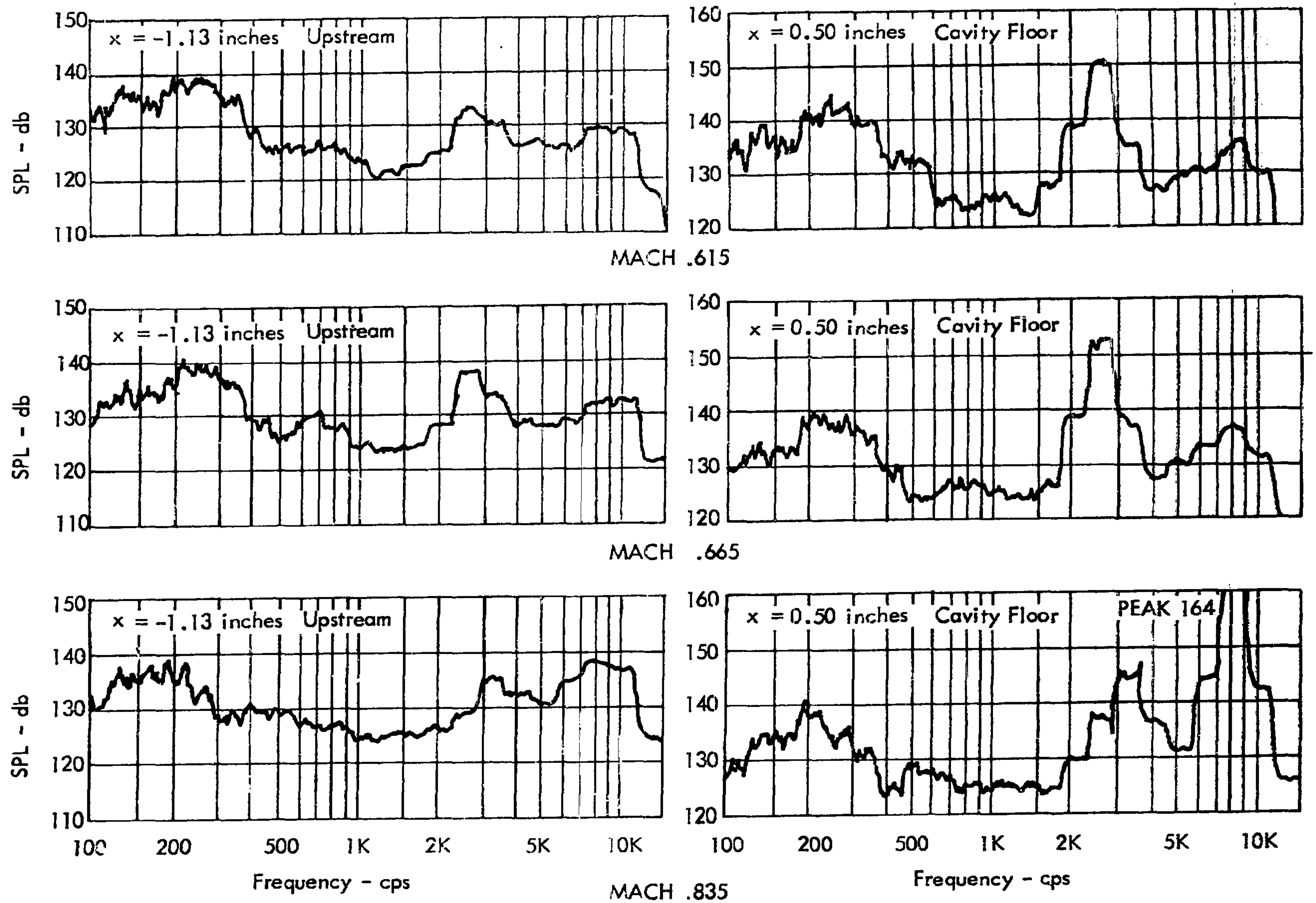


FIGURE 10. (Contd.)

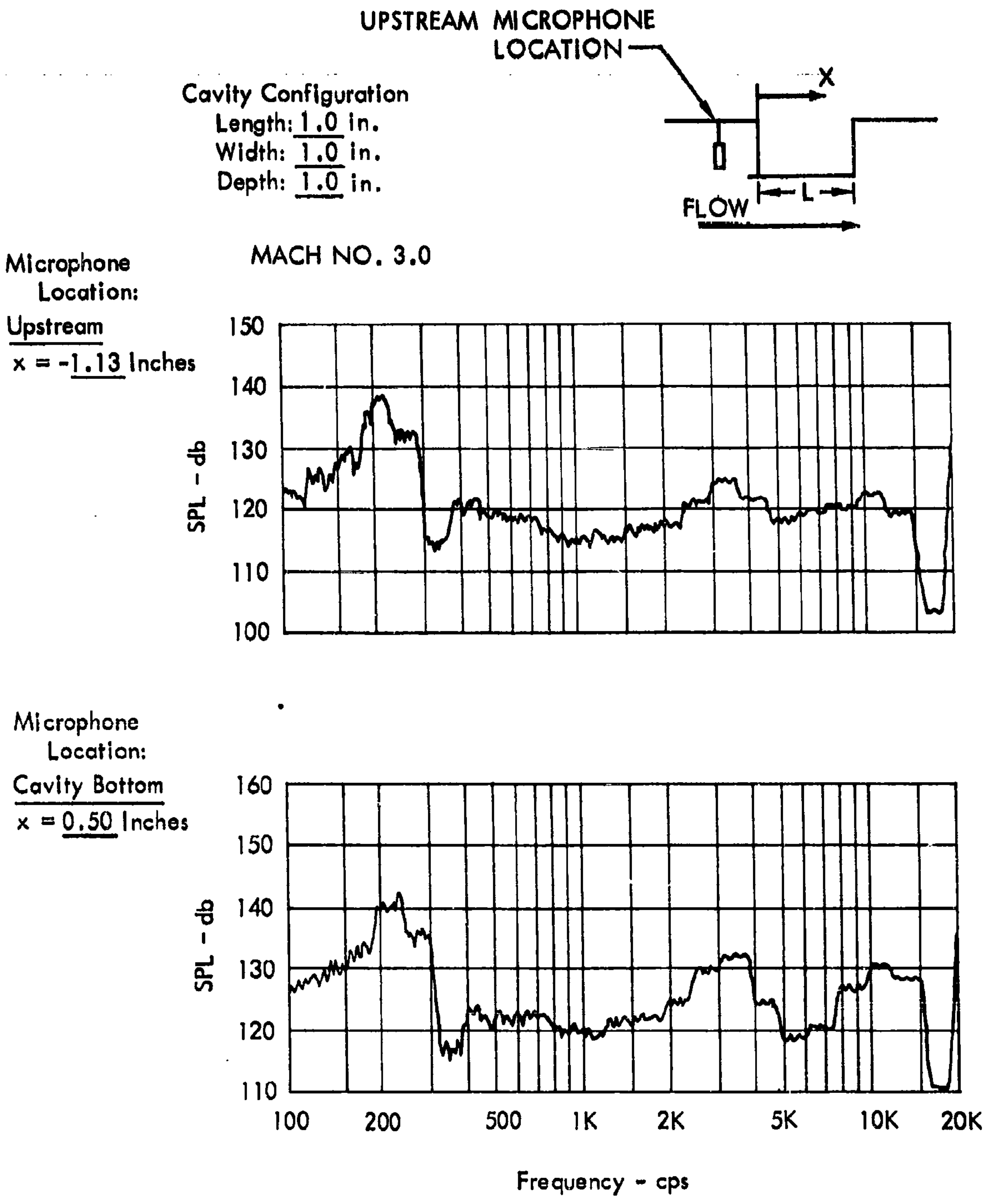


FIGURE 11. SPECTRAL RESPONSE OF A 1" LENGTH X 1" WIDTH X 1" DEPTH CAVITY IN SUPERSONIC FLOW

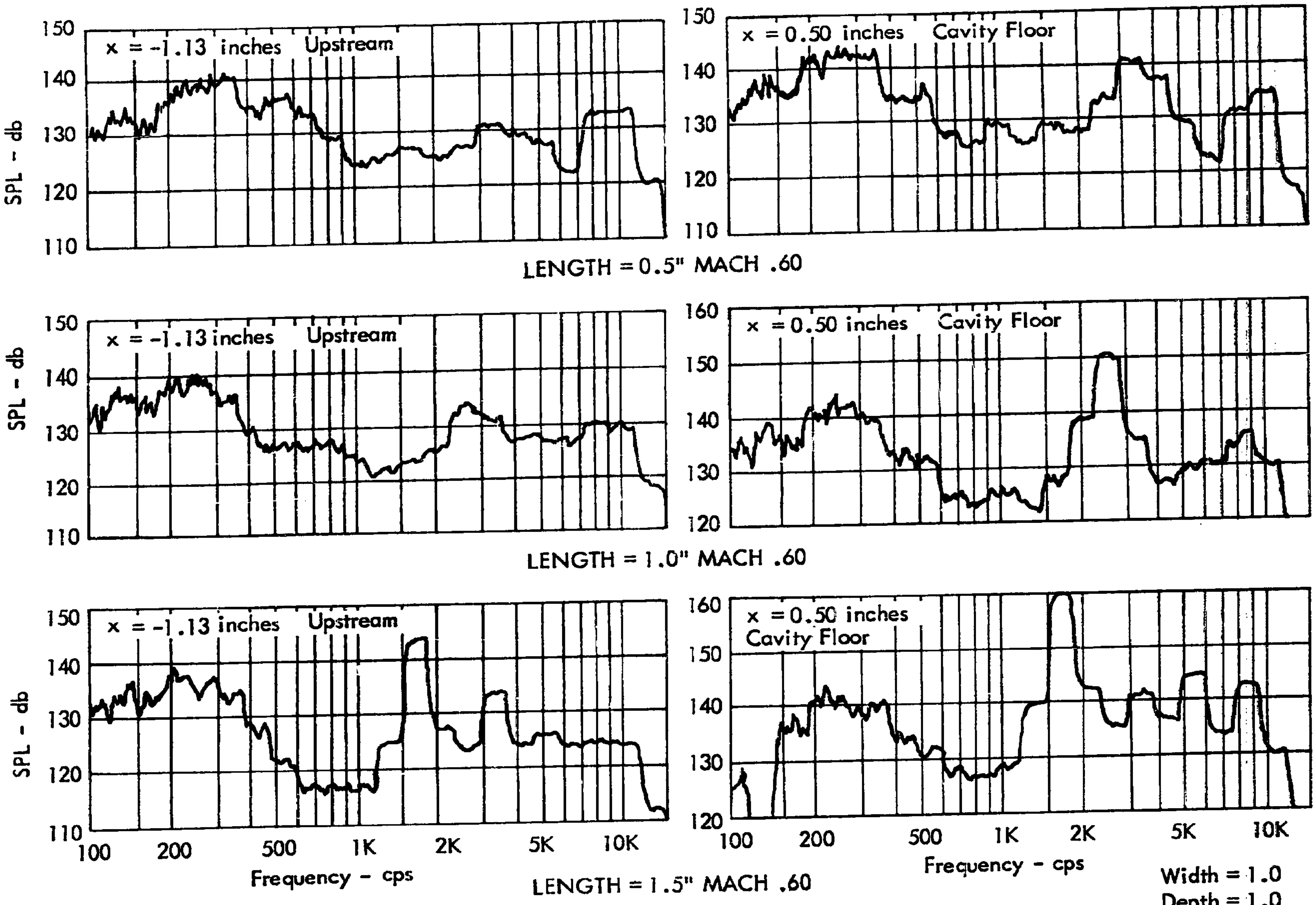


FIGURE 12. EFFECT CF CAVITY LENGTH ON SPECTRAL RESPONSE
(x = 0 at leading edge of cavity)

V - EXPERIMENTAL RESULTS - AEDC

The more detailed tests were performed in the 40" X 40" supersonic tunnel at AEDC, using the model of Figure 7. The procedure followed in the test program was to obtain data at various Mach numbers at as nearly constant tunnel "q" as possible, and then to evaluate the effect of "q" at one particular Mach number. Thus, unless otherwise identified, all data presented were obtained at the maximum "q" of 5.00 psi with one exception. At a Mach number of 5.0, it was not possible to obtain full "q" without condensation, hence all data at 5.0 Mach number were obtained at q = 2.68 psi.

A. BOUNDARY-LAYER CHARACTERISTICS

1. VELOCITY PROFILES

In order to define the conditions under which the data were taken, boundary layer profiles were obtained for each tunnel condition. Figure 13 gives the results obtained for Mach numbers of 2.0, 3.0, 4.0 and 5.0. The data points are plotted along with two theoretical profiles. The solid curve in each case gives the conventional 7th power law; the broken curve gives the profile calculated by the theory of Reference 8 for compressible flow. The indications are that the profiles existing on the model agree reasonably well with those for fully-developed turbulent flow.

2. TURBULENCE SPECTRA

To further catalog the flow field in which the data were taken, a limited number of hot-wire measurements of the spectrum of turbulence in the boundary layer ahead of the cavity were attempted. The measurements were successful at Mach numbers of 2.0 and 5.0; at other Mach numbers wire attrition precluded taking of the data in a reasonable length of time.

Figure 14 gives the dimensionless spectra of the longitudinal component which were obtained in each case. At Mach 5.0, the spectrum was found to be typically random. At Mach 2, on the other hand, the spectrum contains a very pronounced discrete frequency, at 2580 cps. The origin of this periodicity is not known conclusively, but it is assumed to be associated with the tunnel itself.

3. AERODYNAMIC NOISE

The microphone located upstream of the cavity afforded the determination of boundary layer noise as further definition of the test conditions. Spectral analyses were made at all test Mach numbers and at five "q" values for one particular Mach number. Figure 15 illustrates the dimensionless spectra obtained at the various Mach numbers. The level of boundary layer noise was found to decrease markedly with Mach number when "q" was held constant. Figure 16 depicts the observed variation of the SPL of three spectrum level samples. The levels at Mach 5.0 have been increased by 6.0 db. since the "q" at that Mach number was approximately one-half that at all the other Mach numbers considered.

The indications are that Mach number plays a large part in determining the pressure level of aerodynamic noise. As shown in Figure 16, spectral levels of three typical frequencies varied from around 110 db at Mach 1.75 to around 68 db at Mach 5, a range of 42 db.

Figure 17 plots the overall level in terms of its ratio to dynamic pressure as a function of Mach number. It is observed that again a large effect of Mach number is indicated. Implicit in the above mentioned figures is a decrease in static pressure with increasing Mach number. This may be as much a controlling factor in the reduction of sound pressure as the effect of Mach number. For this reason the static pressures corresponding to the test Mach numbers are included on Figures 16 and 17.

The numerical values obtained for $\sqrt{p^2}/q$ are somewhat disconcerting in that they are appreciably lower than those obtained in other investigations. This difference may reflect the lower-frequency limitation in the present case, which for convenience of analysis was 200 cps. The analyzer used had the capability of continuous analysis through two decades, either 20 - 2000 cps or 200 - 20,000 cps. To obtain the full range from 20 - 10,000 cps required twice the analysis time; therefore, the analyses were limited to a lower cutoff frequency of 200 cps. In view of the rising spectrum envelope at the low frequencies, it would be expected that the overall SPL may be appreciably higher when frequencies down to, say, 20 cps are considered.

B. CAVITY RESPONSE

The results of the test program indicate that the pressure response of a cavity can be categorized broadly as a dual phenomenon - a discrete frequency resonant response and a random buffet response. The former is hypothesized to result from excitation of the normal acoustic modes of the cavity; the latter results from the unstable nature of the separated flow in some cases, which tends to permit an intermittent direct impingement of flow on the rear face of the cavity. As might be expected, the buffet response is greatest for the larger cavities.

The discussion to follow considers three aspects of the response, i. e.

1) The flow characteristics
2) The frequency response
3) The magnitude response

1. FLOW STUDIES

The characteristics of the flow associated with a cavity were investigated in detail by means of high-speed Schlieren movies and static pressure measurements, and to a lesser extent by oil-flow movies which permit visualization of flow conditions on the floor of the cavity.

a. Schlieren Indications

Schlieren movies taken at 8000 frames/sec indicate that the cavity induces a highly unstable flow condition in some cases. A typical case is shown in Figure 18, which presents 12 consecutive frames from the movie of an 8" length 2" width and 2.5" depth cavity at a Mach number of 2.0. Each frame comprises the view shown by the dotted lines in the insert and the boundary layer is identified as the white band in the right corner of each figure.

The instantaneous displacement profile of the separated boundary layer is seen to assume a variety of shapes, reflecting an unstable, rapidly fluctuating flow state. Although not clearly shown in this figure, the movie itself indicates that such extremes are encountered at the front of the cavity and that there is sometimes a shock rather than the expected expansion fan.

Further investigation of the fluctuating boundary-layer displacement was conducted to determine the time history of displacement at certain representative lengthwise stations along the cavity. Figure 19 shows a sample of the results at Mach 2.0 for an 8" L X 2" W X 1.5" D cavity. Here the locus of the free-stream side of the boundary layer (as defined by Schlieren pictures) with reference to an arbitrary zero is plotted against time to give the wave shape of displacement.

There appears to be a definite tendency to periodicity in every case, with a lower-frequency predominance near the rear of the cavity. This latter trend is accompanied by a pronounced increase in amplitude at the rear of the cavity as well. The maximum excursion is observed to vary from 0.18" at the 2" station to 0.6" at the 6" station. Similarly, the rms value of displacement varies from .052" at the 2" station to .161" at the 6" station.

Further evidence of the periodicity of this motion is afforded by the correlation between various pairs of points along the streamwise dimension. Correlation coefficients, defined as

$$R_x = \frac{\overline{T_2 \, T_N}}{\sqrt{\overline{T_2^2}}\sqrt{\overline{T_N^2}}}$$

were determined numerically from the time history records for a cavity of length 8", width 2", and depth 1.5" at Mach 2.0. Figure 19b gives the correlation diagram which was obtained therefrom. The curve is very similar to that associated with a periodic wave, especially in the rather high degree of negative correlation obtained. On the premise of periodicity, indications are that the wavelength is of the order of 4.8 inches (taking the average of positive and negative abscissae intercepts). This corresponds to a frequency of

$$f = \frac{c}{\lambda} = \frac{1100 \times 12}{4.8} = 2750 \text{ cps}$$

Reference to Figure 27a indicates that the predominant pressure response of an 8" cavity occurs at 2200 cps, at which frequency the sound pressure level in the cavity is at least 10 decibels above that of any other frequency.

These fluctuations of the boundary layer show a strong correlation with cavity dimensions. At a given Mach number, the fluctuations become very small when cavity depth is decreased to 1". Conversely, they become larger as depth is increased. Figure 20 illustrates this tendency for depths of 1.0", 1.5" and 2" at stations 2" and 5" from the cavity leading edge. The change in maximum excursion between a depth of 1.5" and 1" is quite apparent, particularly in the rear of the cavity. Where a maximum excursion of 0.6" occured at the 5" station for 1.5" depth, the maximum is only 0.3" for 1" depth. At 2" depth, the maximum excursion is 0.7".

As would be expected short cavities do not show nearly the instabilities that are shown for the 8" cavity, the separated flow being able to bridge the gap. The Schlieren movies reveal that there are fluctuating displacements in the case of a short cavity, but these appear to be more in the nature of an inphase motion throughout the cavity length.

Certain other features of the flow over a cavity become evident in the pictures, however, as shown in Figure 21. Here the cavity is short enough (1" length) that the field of view of the camera permits observation of the flow for some distance downstream of the cavity. Clear evidence of a periodic disturbance in the boundary layer is seen. Presumably this is a traveling-wave disturbance, which is probably also present with long cavities as well.

A sample time history for the 4" cavity length is shown in Figure 22 in the interest of completeness. Comparison of this figure with Figure 19 shows that the fluctuations are greatly reduced at the 4" length.

b. Oil-Flow Movies

Model-fabrication considerations precluded the possibility of direct Schlieren view of flow conditions inside the cavity. Therefore in an effort to gain insight into flow conditions therein, a limited number of movies were made with the floor of the cavity covered with a film of oil containing luminescent particles in suspension. Illumination of the model with black light then made the oil clearly visible. These were not particularly revealing, although there was definite indication of a vortex within the cavity in some cases. Figure 23 shows the photographs for lengths of 0", 1/2", 1", 2", 3", 4", 5", 6", 7", and 8". The view shown is almost directly into the cavity, with flow from left to right at a Mach number of 2.0. At length 1/2" the oil tends to collect in a lateral line about halfway back in the cavity. The same pattern is evident in the 1" cavity. In the 2" cavity there is clear indication of a vortex formation which seems to have a vertical axis. At longer length there is some slight indication of the same sort of formation, although it is not as clearly defined.

c. Static-Pressure Indications

Static pressures were measured along the cavity floor in all cases. Some runs also had pressure pick-ups on the front and rear walls. Rear wall pressures were usually of the same magnitude as the rearmost floor pressure for a given configuration whereas front wall pressures were usually from zero to ten percent higher than front floor pressure. Due to the scatter and incomplete wall data, the following discussion is concerned mainly with floor data. The model local static pressure is given in all figures in this section, and its relation to cavity pressures can be seen.

(1) Effect of Depth: The depth of an 8" long cavity was varied in half-inch steps from 1" to 3.5" at all Mach numbers. The data obtained at Mach 2 is typical of that for the entire program (Figure 24). A trend of increasing cavity pressure with increasing depth is shown. Pressure profile shape does not change appreciably but is a little flatter for shallow cavities.

(2) Effect of Length: Variation of length has several effects, as indicated in Figure 25. The front floor pressure decreases with increasing cavity length to a point and then rises again. For cavities greater than 4" length, the rearmost floor pressure is considerably higher than that anywhere else in the cavity. At high Mach numbers this was not true, however, the floor profile being almost flat. Lowest floor pressure occured approximately two-thirds of the way back on the floor regardless of actual length.

(3) Effect of Width: Variation of width from 4" to 2" did not change floor pressures, but did produce the higher pressures measured on the front wall which were mentioned previously. No other effects of width changes were observed.

(4) Effect of Mach Number: Increasing Mach number in general gave more scatter in data for a given location, and length and depth effects do not show up as well. The floor profile becomes flatter with increasing Mach number (Figure 26). At low Mach numbers, the rear wall pressures were slightly less than rear floor pressures while at high Mach numbers, the rear wall had slightly higher pressures.

(5) Effect of "q": Increasing "q" from .77 to 5.1 psi at Mach 2.5 produces a general increase in all cavity pressures. Floor profiles tend to be flatter at very low "q" and assume the typical shape at high "q".

2. CHARACTERISTIC FREQUENCIES

The typical response obtained in both the exploratory and AEDC tests is a discrete frequency response containing several peaks. Some of these are harmonic, or nearly so, and some are not. Additionally, the spectrum may contain a random low frequency response which is referred to herein as "cavity buffeting". To illustrate a set of typical responses, Figure 27-a gives the spectra for all lengths tested at a particular Mach number, in this case M = 2. Figure 27-b illustrates the effect of "q" on the spectrum of response.

a. Effect of Dimensions

Figure 28 gives a composite plot of all discrete frequency components which are discernible from the spectra obtained at Mach 2.0. In the sense of a preliminary orientation as to the response frequencies, a family of harmonic curves is shown along with the data. To obtain these curves, a single curve was faired through all data points relating to the second lowest discernible component (selected instead of the lowest component because of its sharpness). The harmonic curves were thus normalized on this as a base.

This figure illustrates the point just made. For any length the frequencies observed are nearly harmonic, but not quite so, and there are usually one or two extra points. It is apparent that there are so many frequencies excited that almost any hypothesis can be supported, depending upon how the data are viewed. For that reason, the final analysis of the entire response spectrum will be discussed in that section of the report wherein theoretical and experimental comparisons are drawn.

For the present, certain conclusions seem warranted by the data for the first four response frequencies. First, the trend of the lowest-frequency response, hereafter referred to as "1st mode," is suggestive of an inverse relationship between frequency and cavity length. Also, the 1st mode and the 2nd mode frequencies are almost exactly harmonic. Thus it might be concluded from these experimental data that at least for the first few modes

$$f \propto n/L_x \qquad \text{where} \qquad n = 1, 2, 3, \text{ etc.}, \quad L_x = \text{cavity length}$$

Figure 29 gives a comparison of the experimental data for each of the first four modes with the curve depicting this relationship. In order to broaden the scope of the results and perhaps bring into perspective other parameters, data are plotted for the 1" depth along with the 2.5" depth, and for a 4" width and 2.5" depth as well.

For lengths from 4" to 8" the 1st mode data seems to follow the $f \propto n/L_x$ curve very well, regardless of cavity width or cavity depth. For lengths of 2" and less, however, the lowest observed experimental frequency is appreciably less than indicated by the $f \propto n/L_x$ curve. The same trend appears in the 2nd mode comparisons. For the 3rd mode, the divergence between the $f \propto n/L_x$ curve and the data is perhaps not as great, but there is a markedly higher degree of scatter.

These results seem to indicate three broad conclusions:

1. The cavity response for long lengths is a different phenomena from that for short lengths, perhaps corresponding to the difference between length modes in the former case and depth modes in the latter.

2. A factor of 2 change in cavity width has little or no effect on frequencies of the first two modes, considering lengths $\geq$ 4". (this is not to say that there will not be a definite width effect on some of the higher modes.)

3. A factor of 2.5 change in depth has no appreciable effect on the first two or three modes of a large cavity, again considering lengths $\geq$ 4".

b. Effect of Mach Number

The observed effect of Mach number is shown in Figure 30. Here the 1st mode is selected for study, and data for Mach numbers of 2.0, 3.0, and 4.0 are plotted together to determine if any systematic effects occur.

In general, the indications are that the effect of Mach number is small. With the exception of the data at 2" length and at 4" length, in every case the points at different Mach numbers are almost coincident.

As discussed previously, the 2" length was found to produce clear indication of a vortex within the cavity. This factor, which suggests that a different flow regime exists at that length, may be the cause of the wide spread in response frequencies shown in Figure 30 at the 2" length.

3. AMPLITUDE RESPONSE

In consideration of the amplitude response both the buffet and resonant contributions must be considered. These are discussed individually in the following:

a. BUFFET RESPONSE

The buffet response of the cavity is characterized by a random spectrum which reaches its maximum value in every instance at the lower limiting frequency of the analyses. Thus, there is some uncertainty as to what the true maximum may be. Some few analyses made with 100 cps as the lower limiting frequency still showed a rising spectrum envelope. Thus, in view of the uncertainty regarding overall level, all discussion of this facet of the response will be confined to representative spectrum-level variations.

(1) Effect of Cavity Dimensions: Figure 31 illustrates the effect of cavity length and cavity width on the levels observed in 50-cps bands centered at 200 cps and 400 cps. The upper graph gives the results obtained at Mach 2.0 for a 2" width; the lower graph gives corresponding results for the 4" width. The indications are that there is approximately a 10:1 (20 db) increase in buffet level over the length range tested. The buffet response reaches a maximum at the 6" length and remains constant for greater lengths.

The 4" width exhibits about the same response, both in maximum value and minimum value. There is one notable difference, however; the maximum response is reached with a shorter length of 4" in the wider cavity.

(2) Effect of Depth: Although the 2" and 4" widths show very similar buffet response at 2.5" depth, they show markedly different levels of response as depth is systematically varied. Or more precisely, the good agreement shown in the preceeding figure is perhaps only a fortuitous result, for Figure 32 indicates that as depth is varied in an 8" cavity the width becomes an important factor. The 2" width cavity produced a buffet response which increased continuously throughout the range of depths tested, whereas the buffet response of the 4" width cavity reached its maximum at 1.5" depth and decreased thereafter. This result suggests that cavity volume, as well as length may be a controlling parameter in buffet response.

(3) Effect of Mach Number: Figure 33 depicts the effect of Mach number on the buffet response of a given cavity. Sound levels decrease rather uniformly with increasing Mach number.

(4) Spatial Distribution: The streamwise variation of buffet levels in an 8" cavity are shown in Figure 34. The highest levels occur in the rear of the cavity, as might be expected. A difference in level of the order of 15 db. exists between front and rear of the cavity.

b. RESONANT RESPONSE

The amplitude of the resonant response is considerably more difficult to categorize than that of the buffet response since it involves presumably the characteristic distributions of a number of different modes. The following discussion will attempt to derive from the voluminous data obtained certain conclusive indications of a general nature.

The distribution of sound pressure inside a given cavity is, of course, a matter of interest. This facet of the response is best studied with a long-cavity configuration, where data are available from a number of microphones. Figure 35 shows the distributions of pressure in the first four modes as observed in the streamwise direction on the centerline of the floor in a cavity of length 7" and depth 2.5". The Mach number for this example is 2.0.

The most general result indicated is that, regardless of the shape of the distribution curve, there is a pronounced tendency for the response to be greatest near the upstream end of the cavity. Or, stated another way, it appears that whatever typical response exists, it is subject to the superposition of what is probably an exponential decrease of intensity in the streamwise direction. It is observed that this is directly opposite to the buffet distributions.

Now consider the individual responses. In the first and third modes there is a definite tendency for a standing-wave type of distribution, perhaps as shown by the curves which have somewhat arbitrarily been drawn through the data. On the other hand, the distribution for the second mode has very little tendency toward periodicity but accentuates the exponential decrease.

The same sort of cyclical response as that just discussed for a given length occurs at a given point as the length of the cavity is varied. For example, Figure 36 (a) shows the response at a point 1/2" from the leading edge of a cavity whose length was systematically increased from 0.625" to 7" at a Mach number of 2.0. Cavity depth was held constant at 1" and width at 2". Extremely wide variations of pressure are found to occur in each of the first three modes. The pressure at this particular point was found to reach a maximum when the length was adjusted to 2", and to decrease sharply as length was further increased. At the 5" length a minimum was recorded, and at still greater lengths another substantial increase in level occured. Perhaps it should be noted that two unusual conditions are associated with the 2" length. First, at this Mach number, both the hot-wire turbulence spectrum and the upstream boundary-layer-noise spectrum showed a strong periodic component. In the turbulence spectrum this occured at about 2580 cps.

In some cases the cavity response has a peak very close to this frequency. This may only reflect cavity response off-resonance to discrete-frequency forcing, but it may also reflect coincidence of the discrete input with a cavity resonance in which case a very large response would be expected.

Secondly, the oil-flow movies revealed that the 2" length permitted a pronounced vortex formation in the cavity, which could also change the response greatly.

Further indication of the possible uniqueness of this response is afforded by the set of partial curves at the right of Figure 36 (a). These were obtained under precisely the same conditions as the other data, except that the depth was held constant at 2.5" instead of 1". Unfortunately malfunction of the cavity drive mechanism precluded the setting up of lengths less than 3", so that the response of the 2" length was not obtained at this depth. Even so, from the data at lengths greater than 2" it is apparent that this deeper cavity represents a quite different situation. It is also clear that over most of the common range of lengths of the two sets of data, pressure response in the 2.5" depth is several orders of magnitude greater than that in the 1" depth. This result is certainly consistent with the indications of Figure 21, which led to the conclusion that the boundary-layer fluctuations of the 1" deep cavity were considerably less than those of the 2.5" cavity.

Figure 36 (b) gives a comparable plot to that of Figure 36 (a) but a Mach number of 3.0. Two things are evident. First, the maximum levels are of the order of 30 db. lower than those at Mach 2.0, a result which is compatible with the reduction of boundary-layer noise between those same two Mach numbers. Secondly, there is no evidence of the extremely high levels at the 2" length. Rather the levels in that vicinity tend to exhibit a more cyclical variation of the type that would be expected of a resonant response.

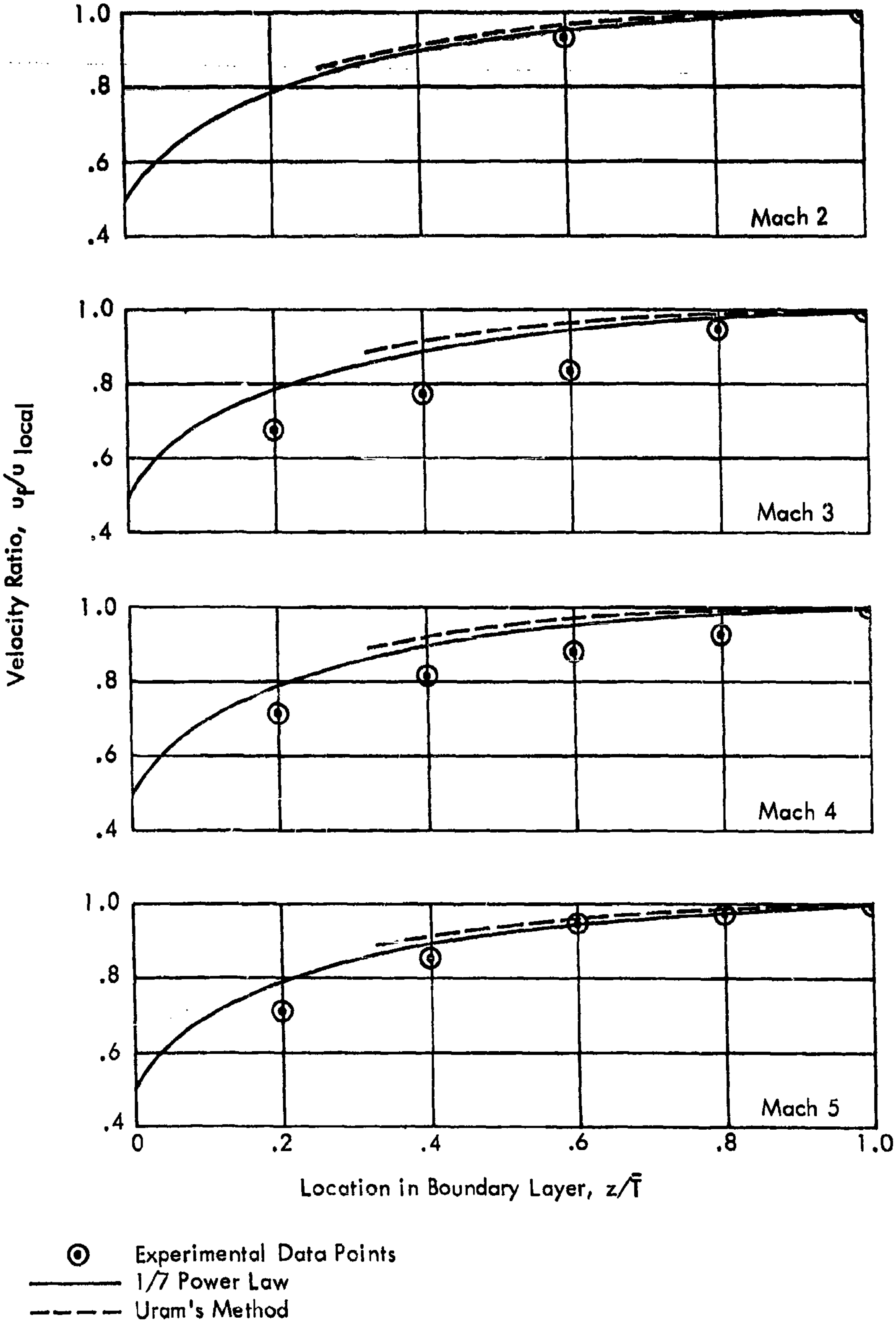


FIGURE 13. BOUNDARY-LAYER PROFILES

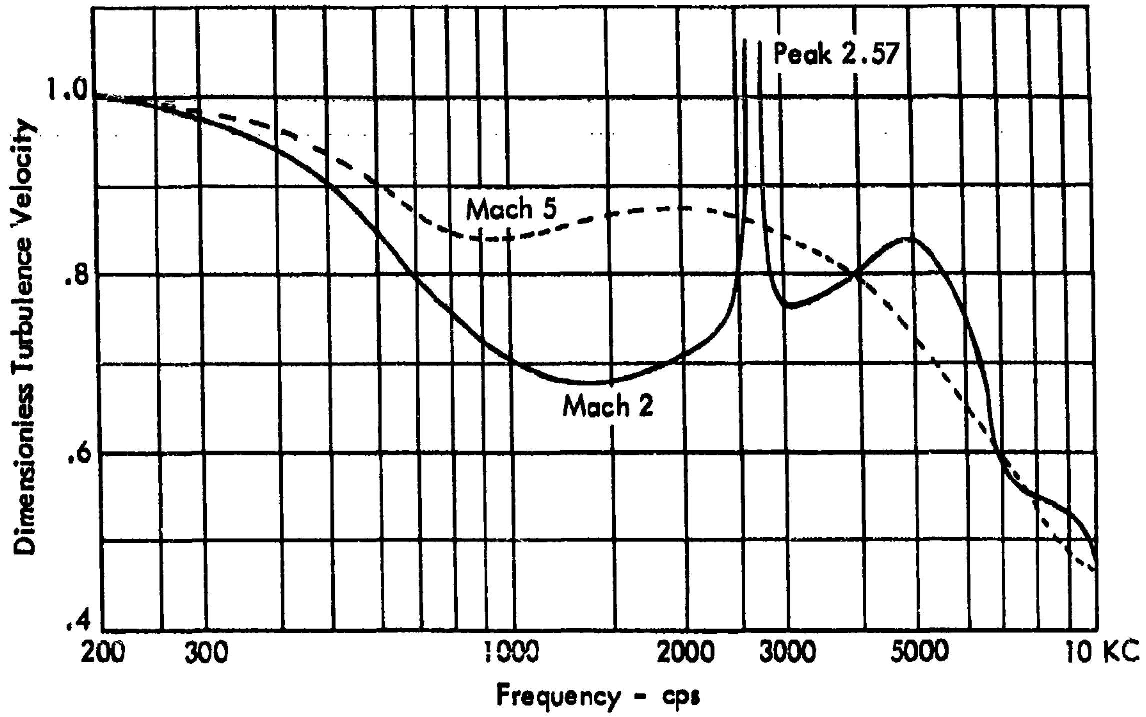


FIGURE 14. BOUNDARY-LAYER TURBULENCE SPECTRA

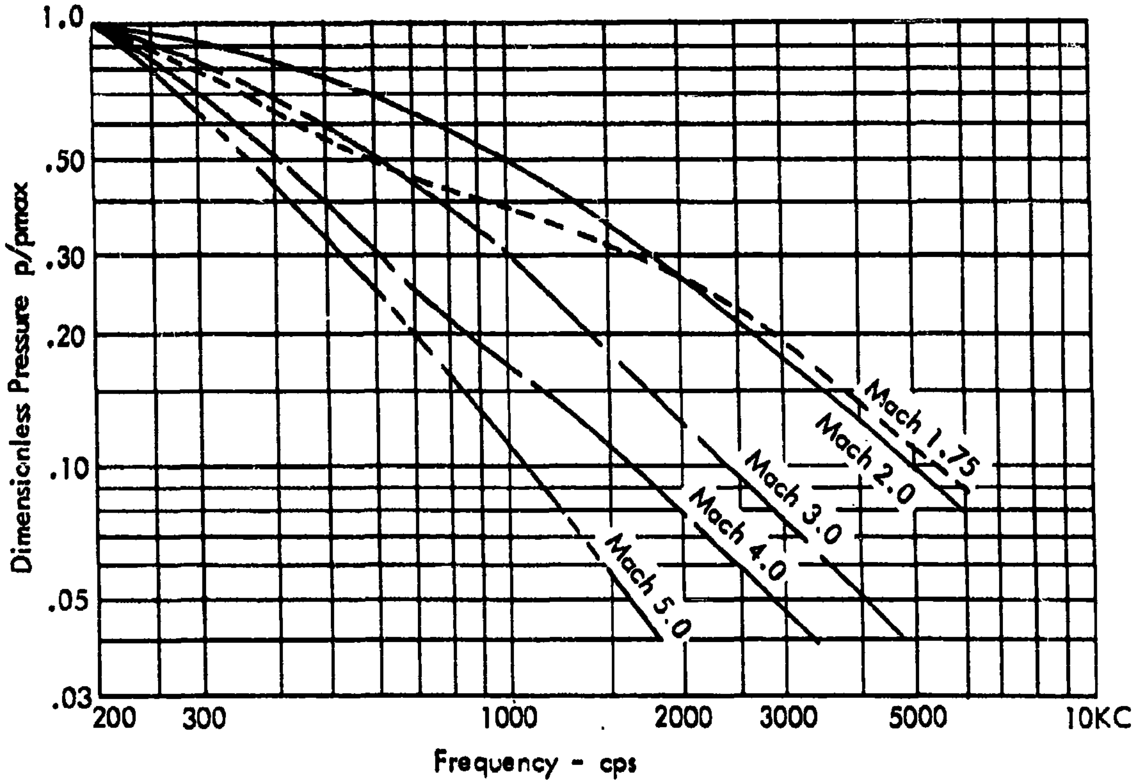


FIGURE 15. BOUNDARY-LAYER NOISE SPECTRA

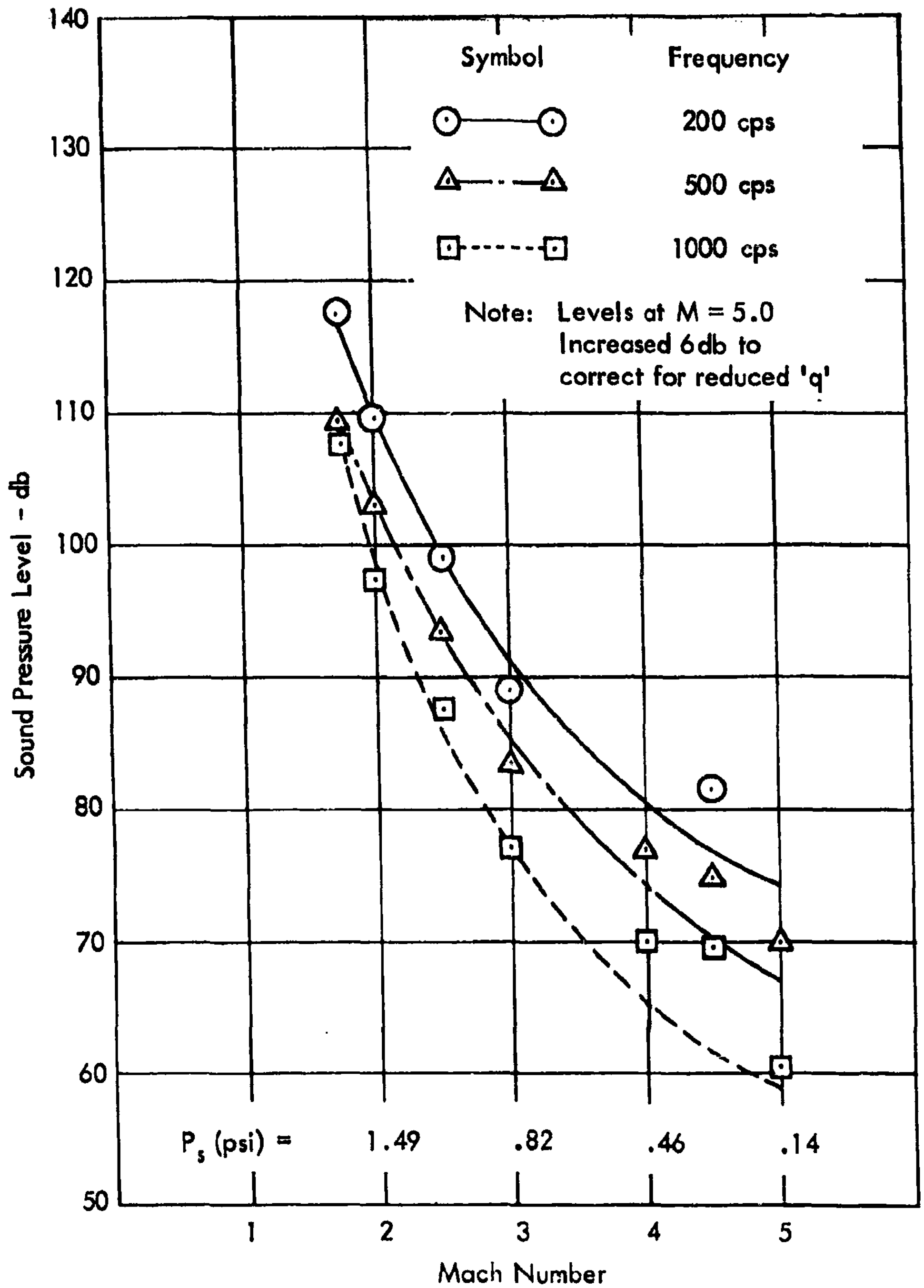


FIGURE 16. EFFECT OF MACH NUMBER ON BOUNDARY-LAYER NOISE

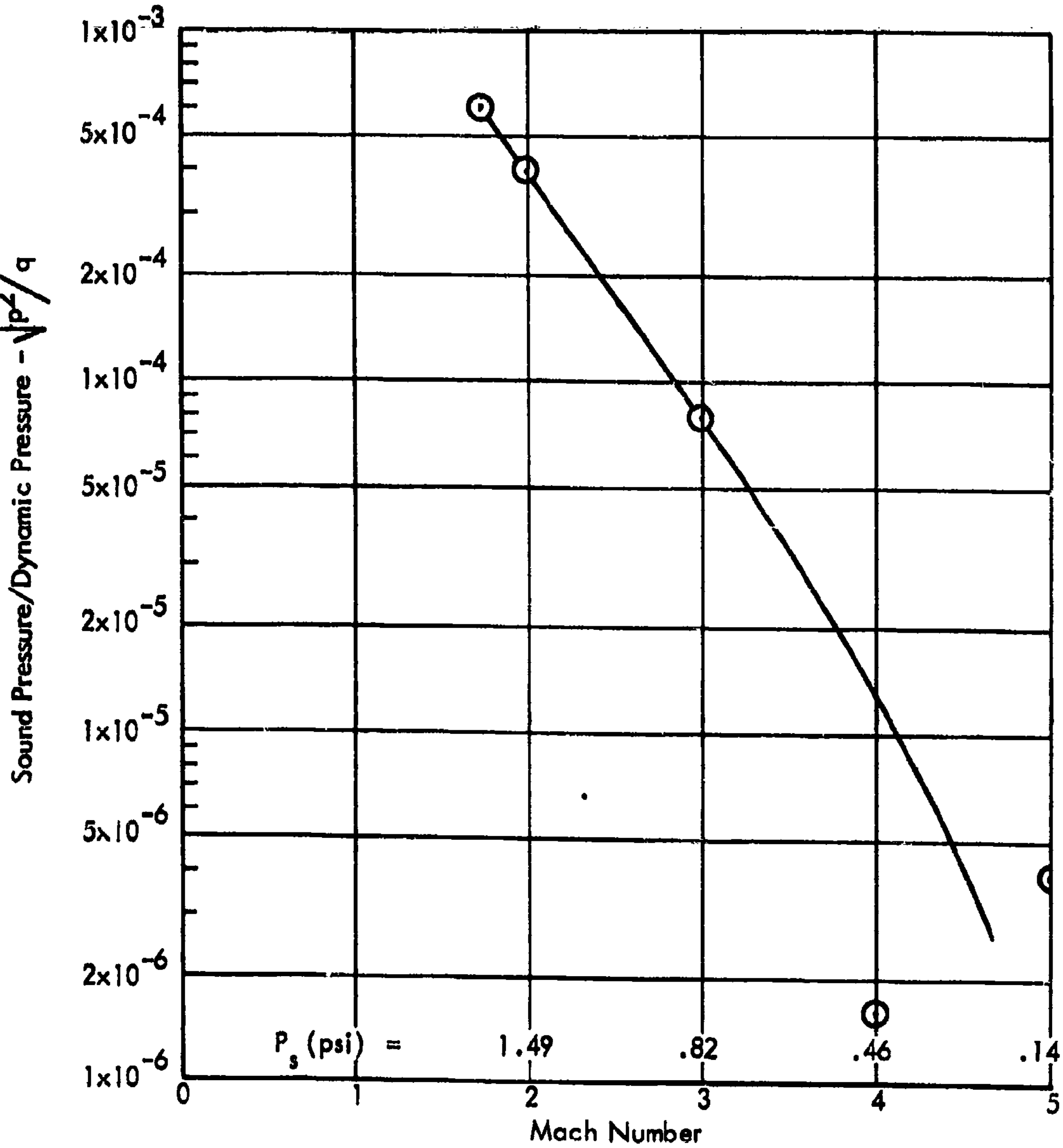
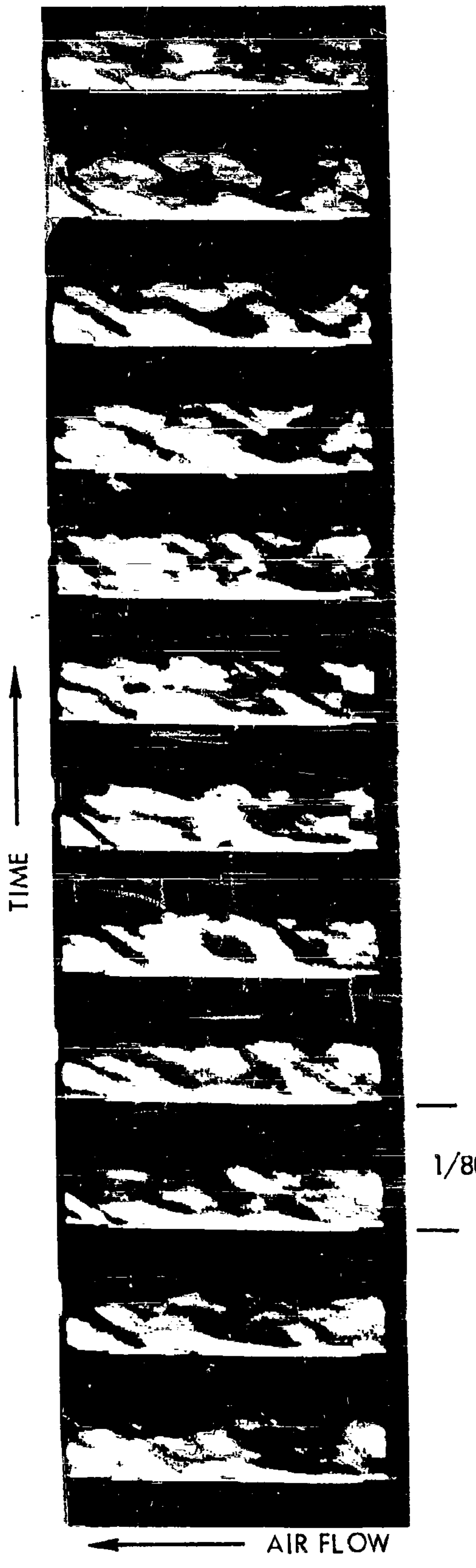


FIGURE 17. EFFECT OF MACH NUMBER AND DYNAMIC PRESSURE ON OVERALL BOUNDARY-LAYER NOISE

LENGTH 8 INCHES
WIDTH 2 INCHES
DEPTH 2.5 INCHES

MACH 2



CAMERA VIEW

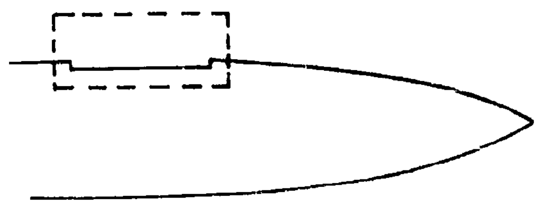


FIGURE 18

BOUNDARY LAYER FLUCTUATIONS ABOVE A LONG CAVITY

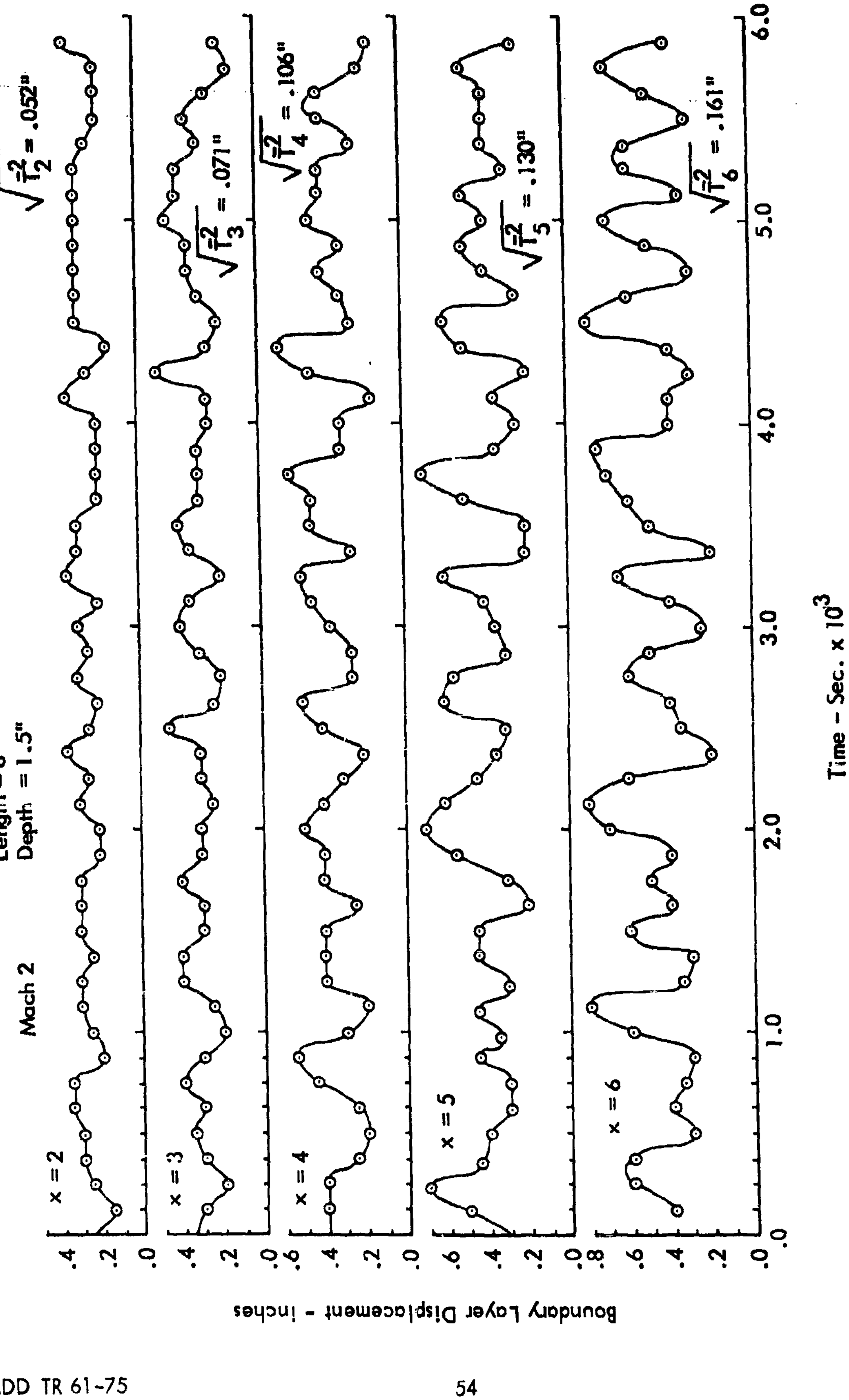


FIGURE 19. TIME HISTORY OF BOUNDARY-LAYER FLUCTUATIONS FOR LONG CAVITY

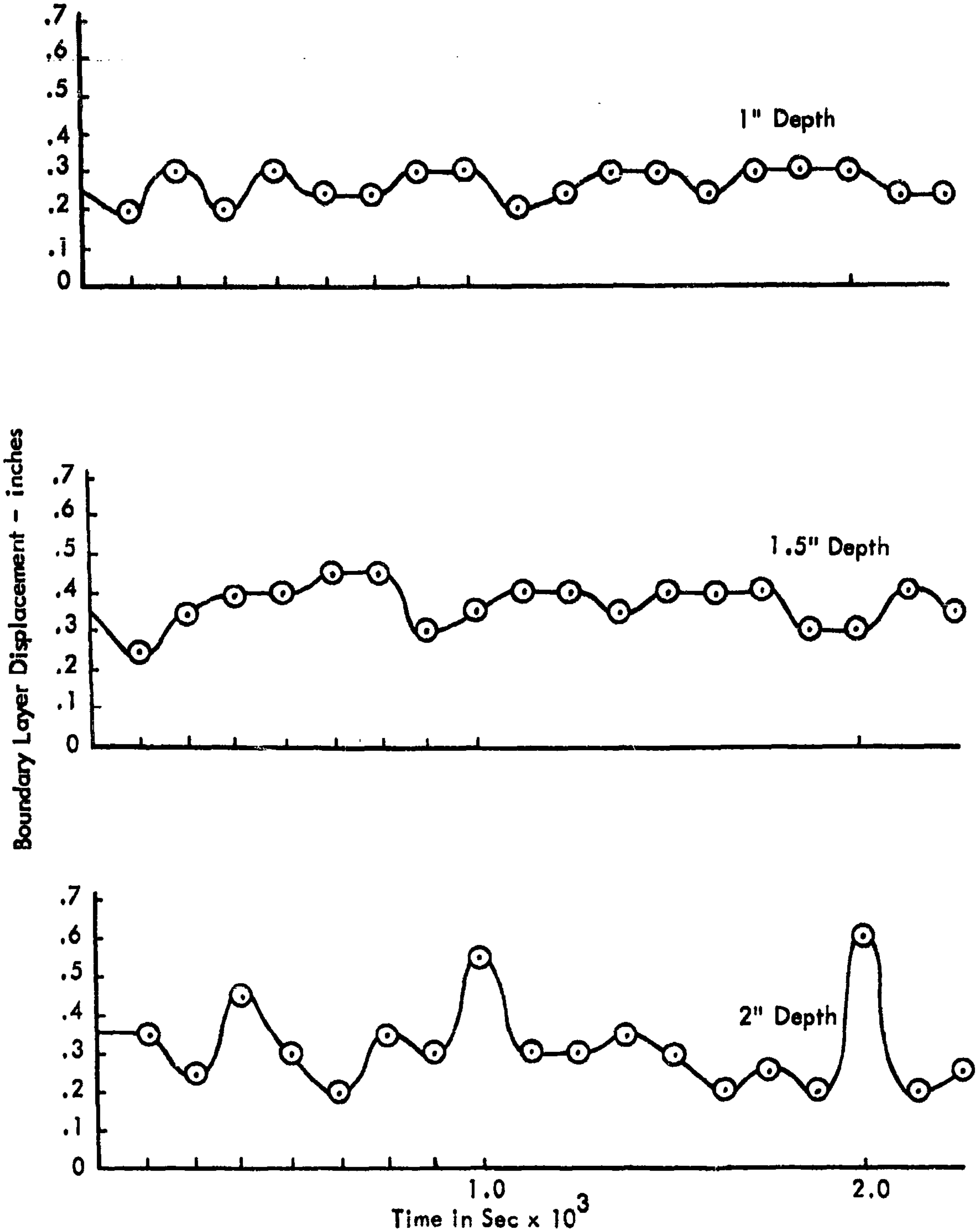


FIGURE 20 (a). EFFECT OF CAVITY DEPTH ON BOUNDARY-LAYER FLUCTUATIONS, M = 2.0,

(Measured At x = 2.0")
Length = 8.0", Width = 2.0"

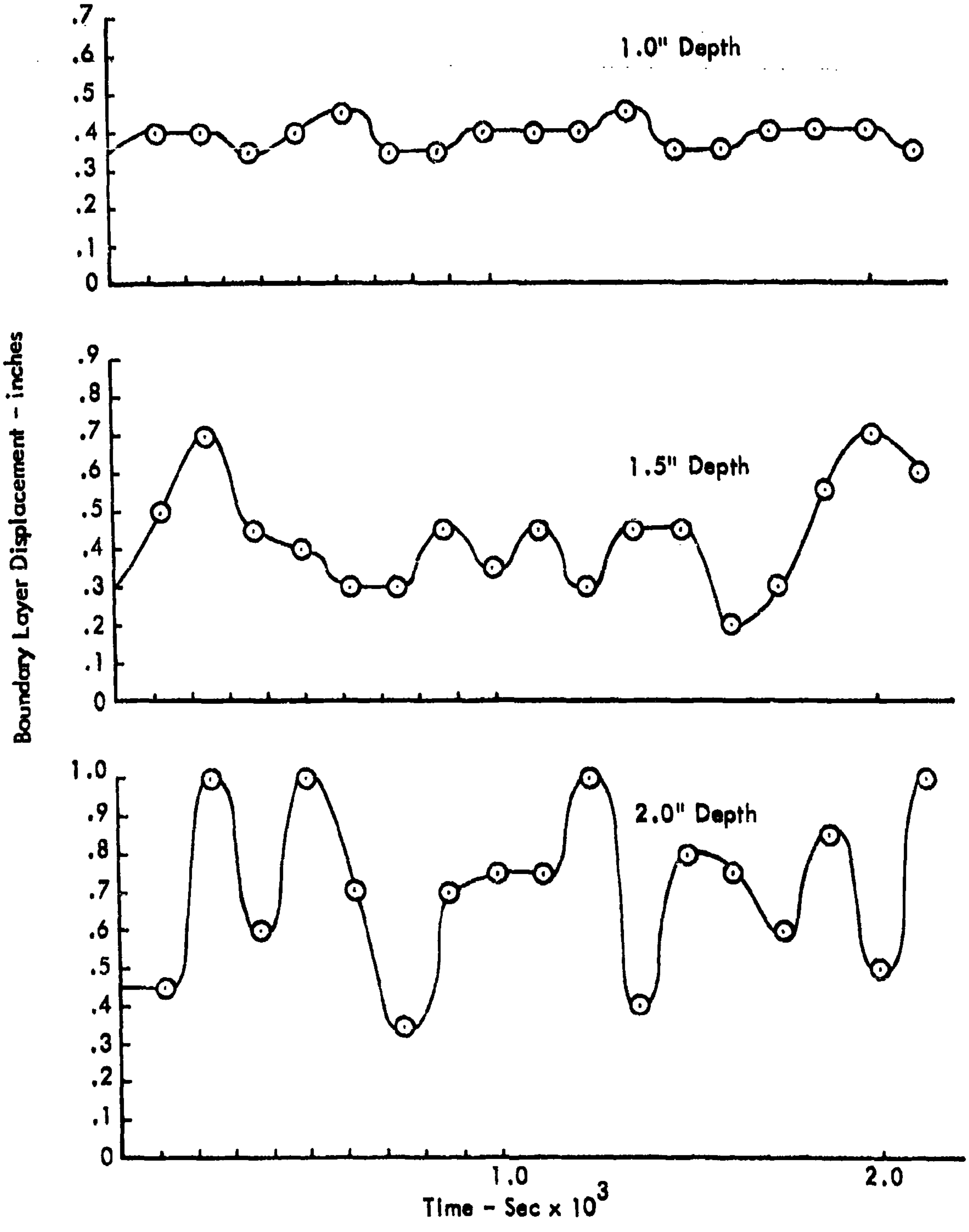
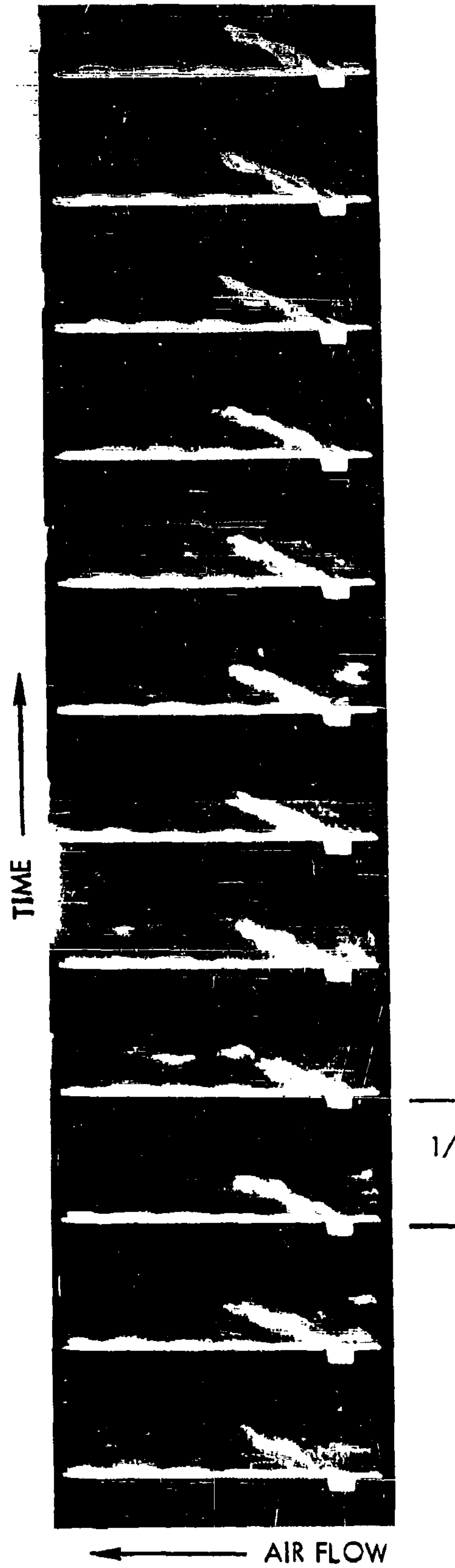


FIGURE 20 (b). EFFECT OF CAVITY DEPTH ON BOUNDARY-LAYER FLUCTUATIONS, M = 2.0

(Measured At x = 5.0")
Length = 8.0", Width = 2.0"



LENGTH 1 INCH
WIDTH 4 INCHES
DEPTH 2.5 INCHES

MACH 2

CAMERA VIEW

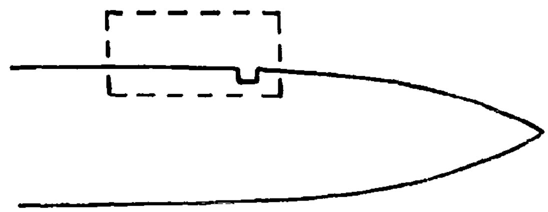


FIGURE 21

BOUNDARY LAYER FLUCTUATIONS DUE TO A SHORT CAVITY

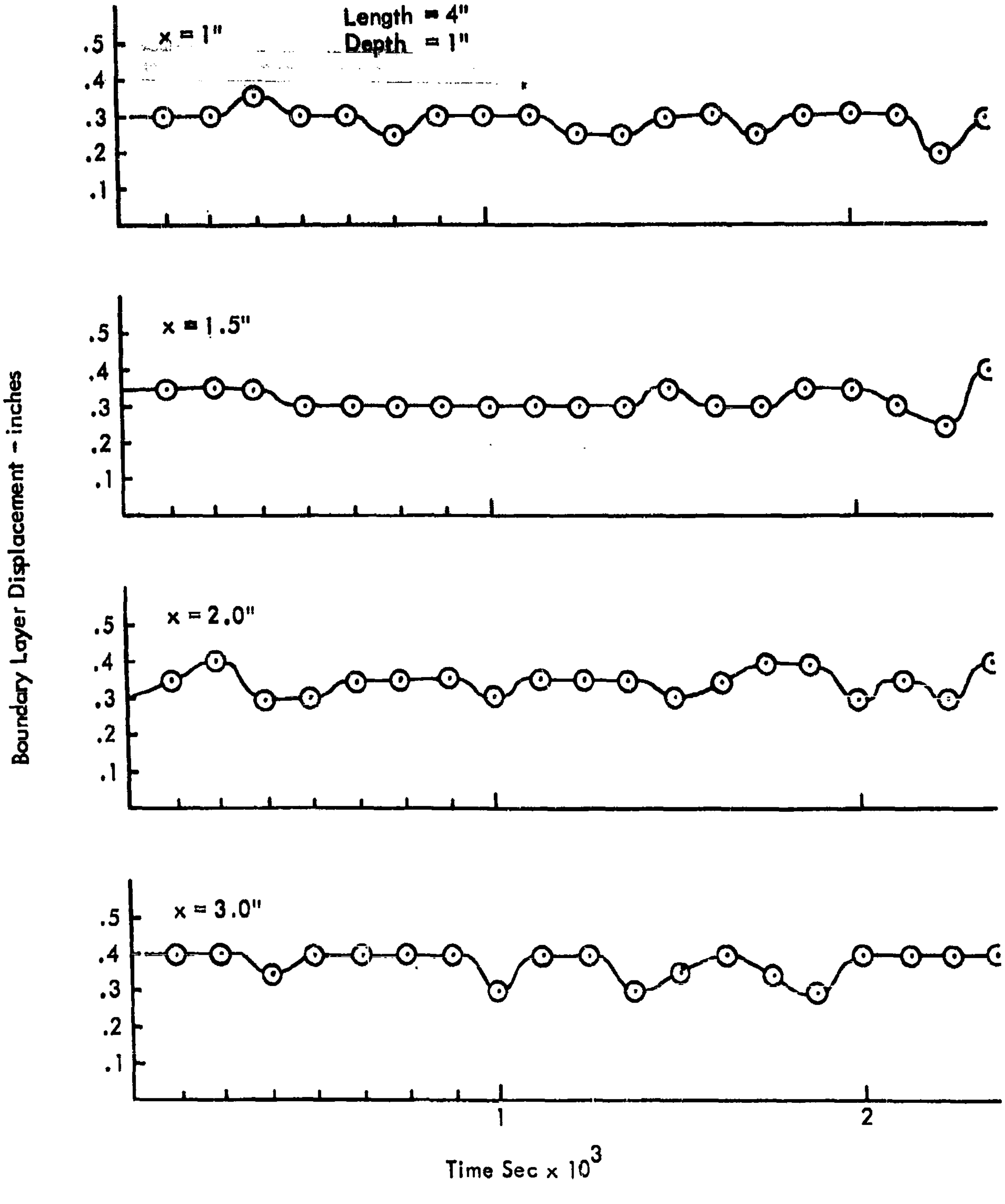


FIGURE 22. BOUNDARY-LAYER FLUCTUATIONS FOR CAVITY OF INTERMEDIATE LENGTH AT MACH 2

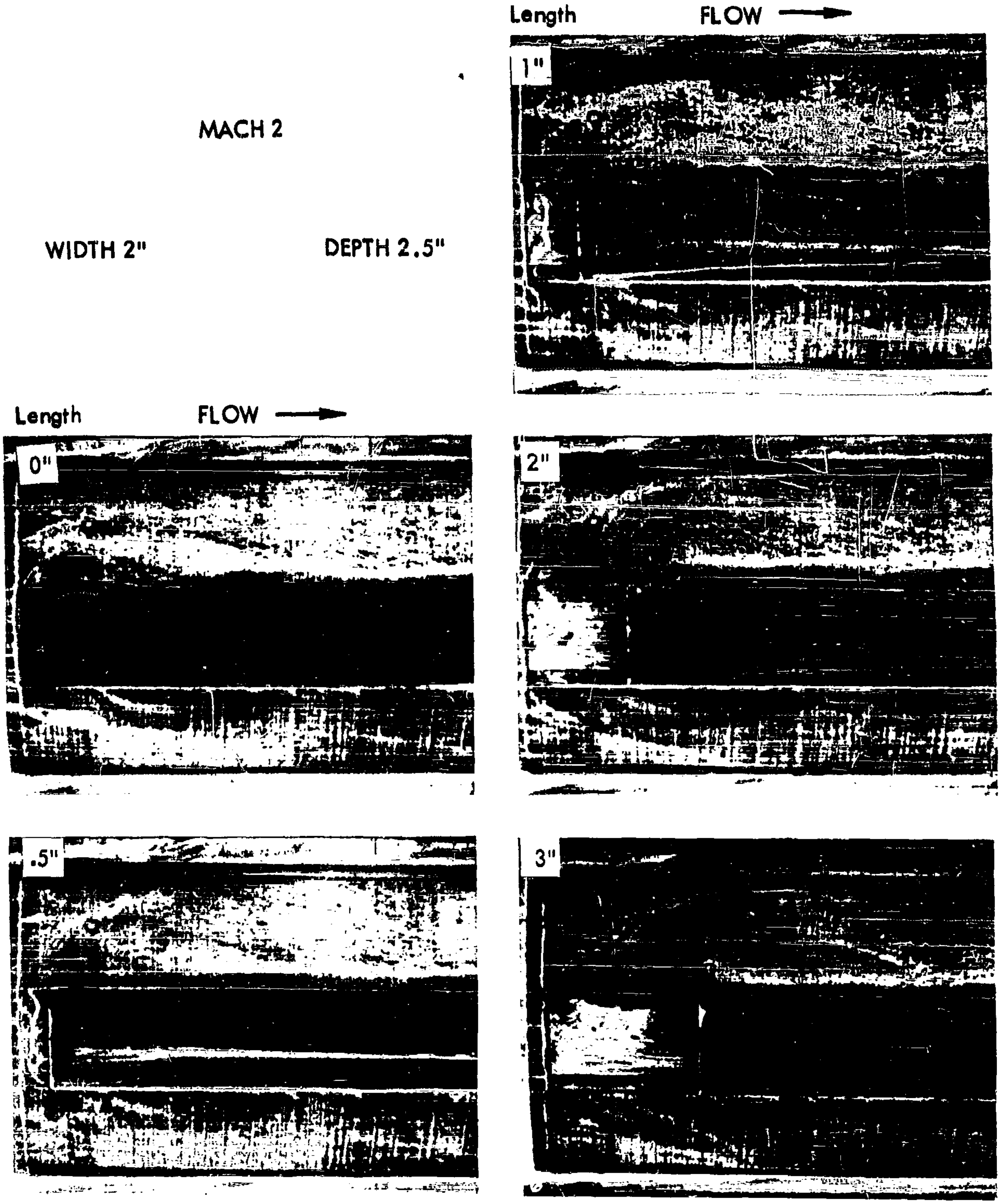


FIGURE 23. OIL FLOW PHOTOGRAPHS OF FLOW INSIDE CAVITY

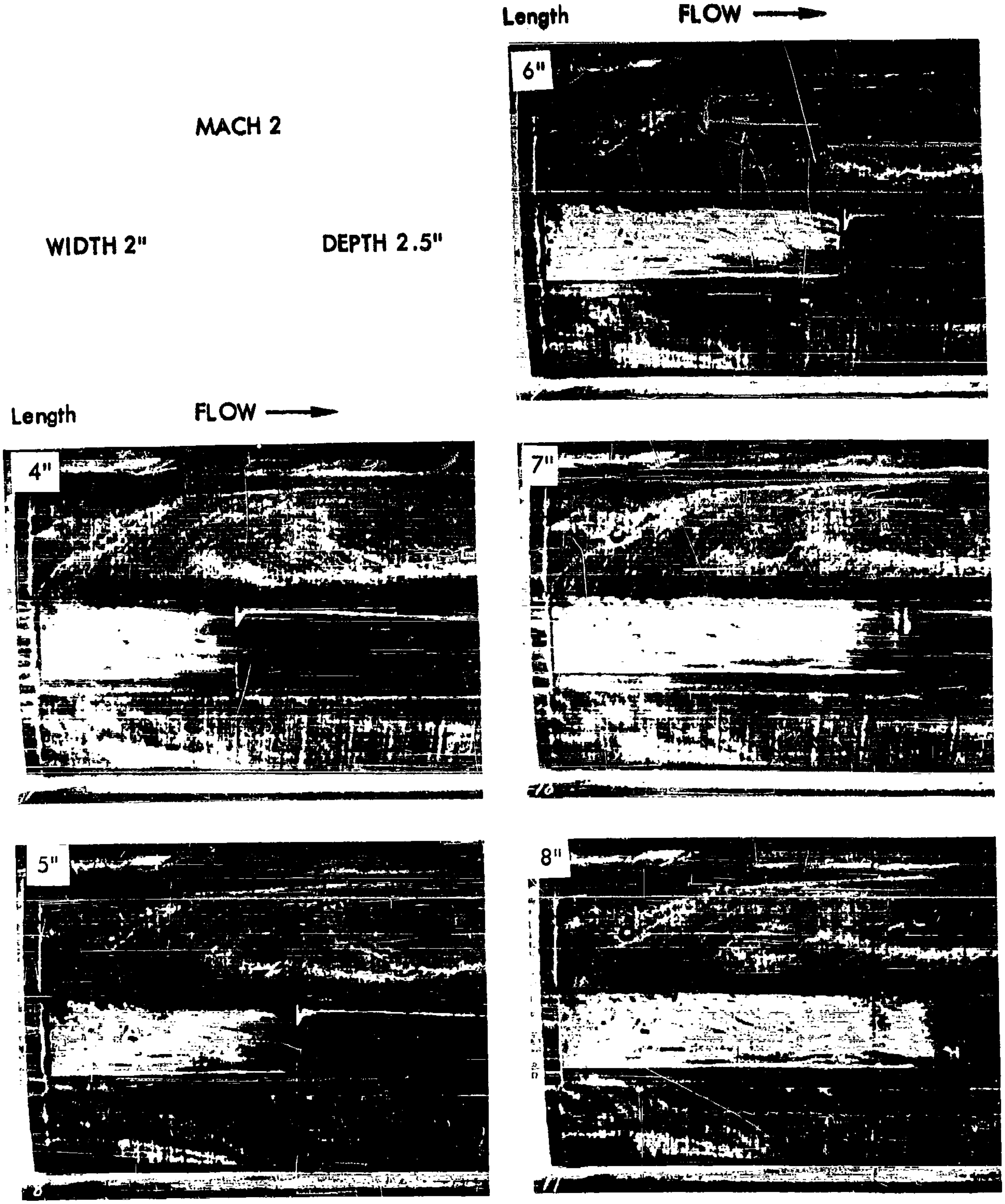


FIGURE 23. (Contd.) OIL FLOW PHOTOGRAPHS OF FLOW INSIDE CAVITY

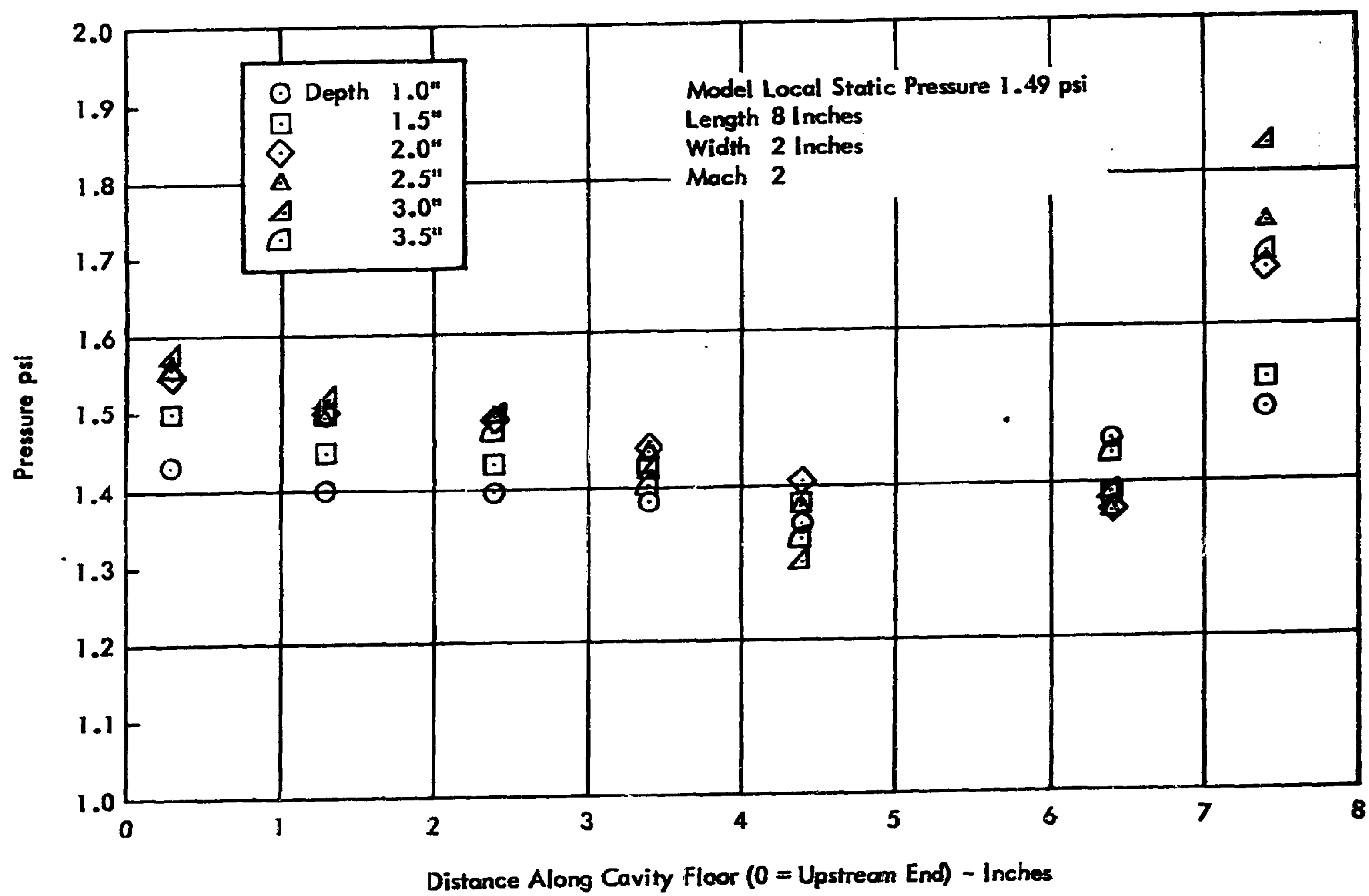
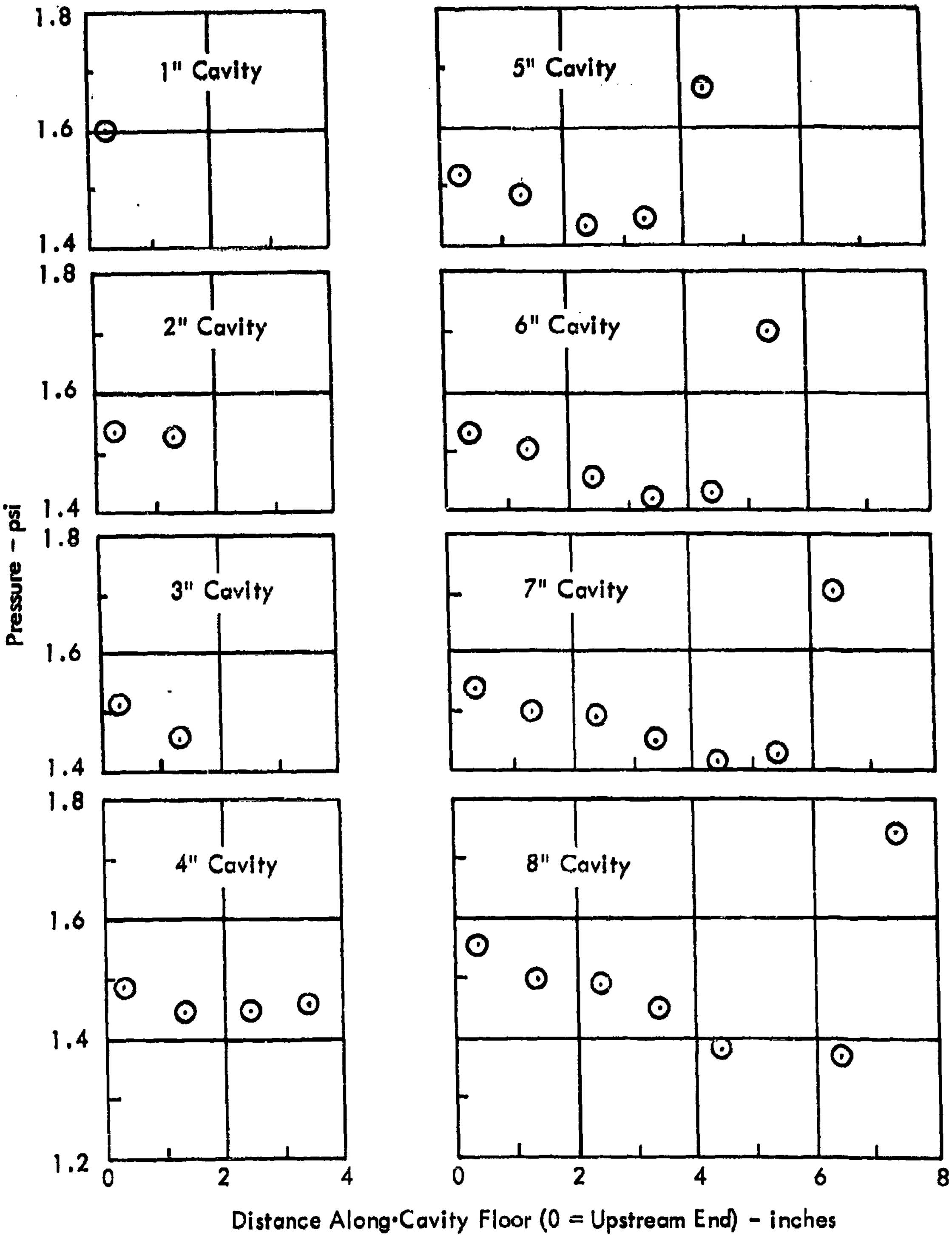
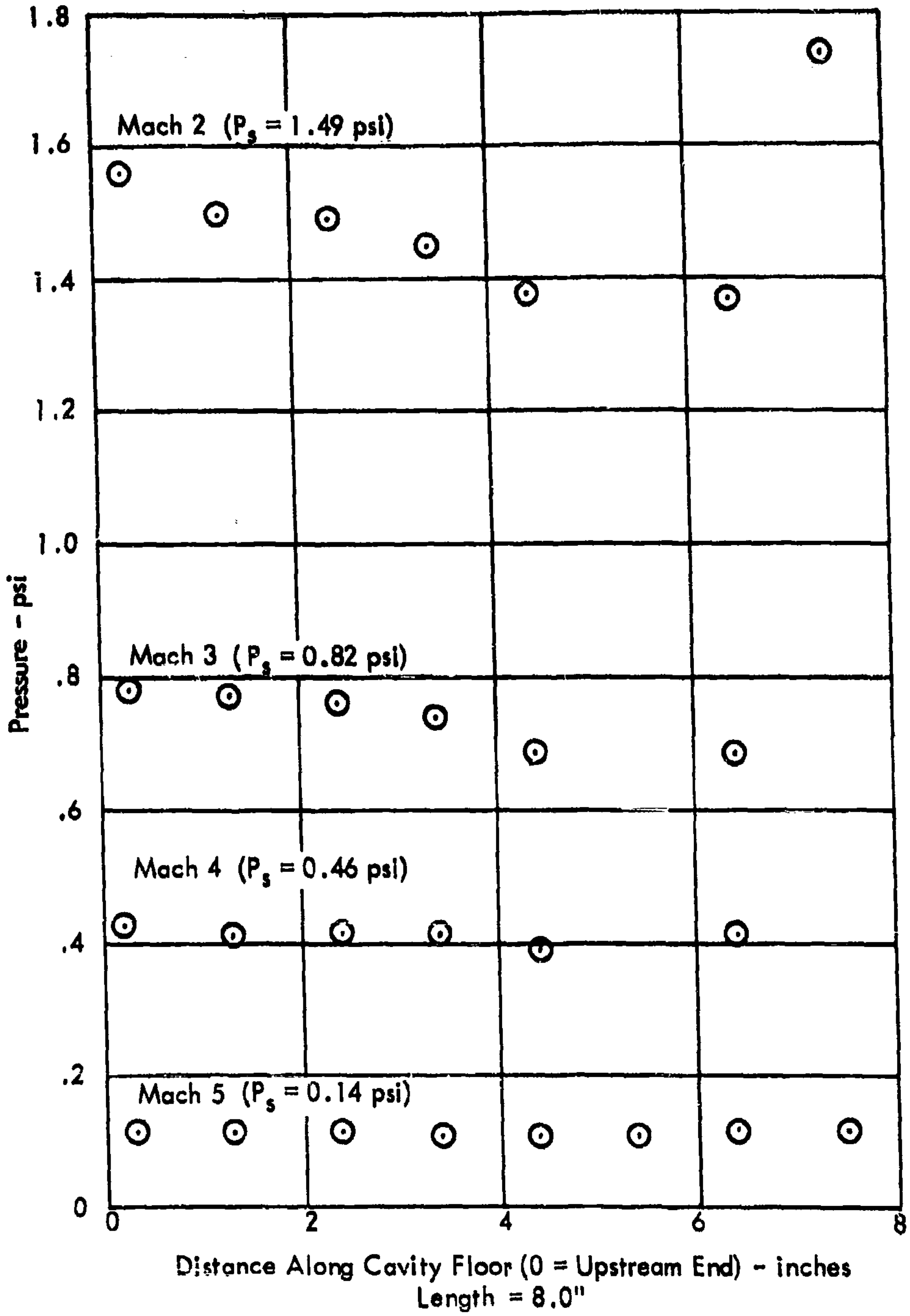


FIGURE 24. EFFECT OF DEPTH ON CAVITY STATIC PRESSURE



Model Local Static Pressure 1.49 psi
Cavity Width 2 Inches, Depth 2.5 Inches
Mach 2

FIGURE 25. EFFECT OF LENGTH ON CAVITY STATIC PRESSURE



Length = 8.0"
Width = 2.0"
Depth = 2.5"

FIGURE 26. EFFECT OF MACH NUMBER ON CAVITY STATIC PRESSURE

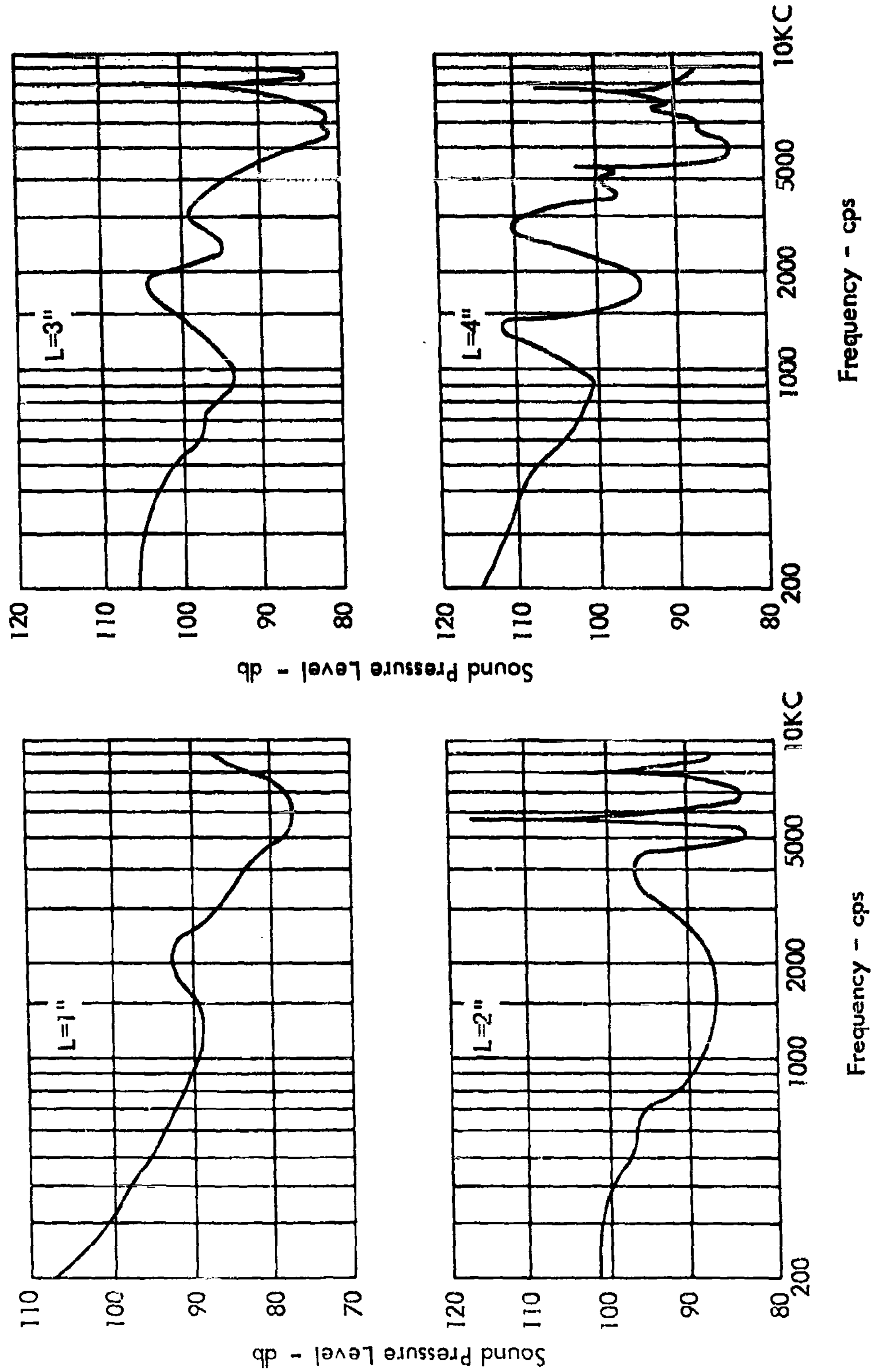


FIGURE 27 (a). TYPICAL FREQUENCY RESPONSE OF A CAVITY IN SUPERSONIC FLOW

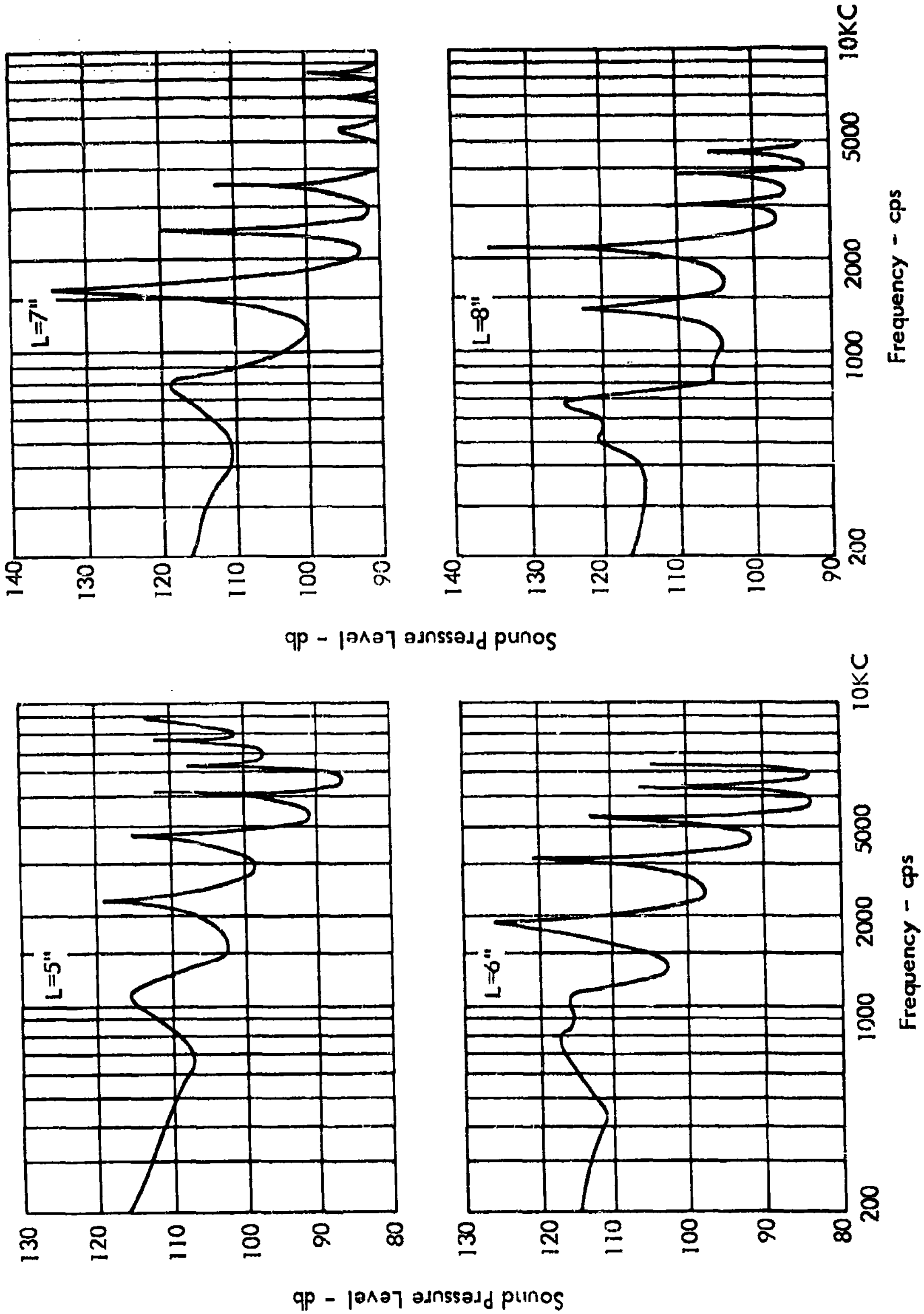


FIGURE 27 (a). (Continued)

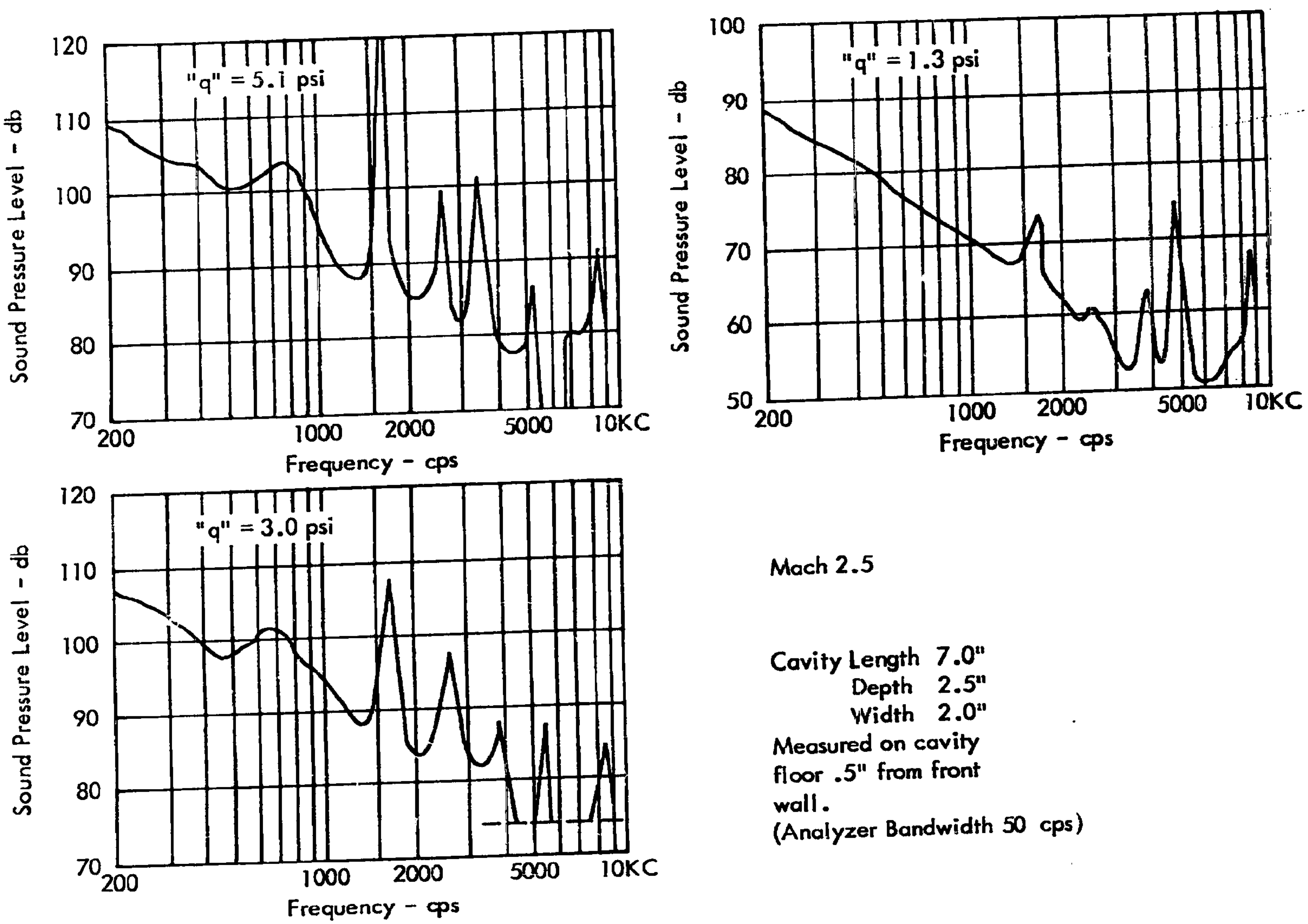


FIGURE 27 (b). EFFECT OF DYNAMIC PRESSURE "q" ON RESONANT RESPONSE

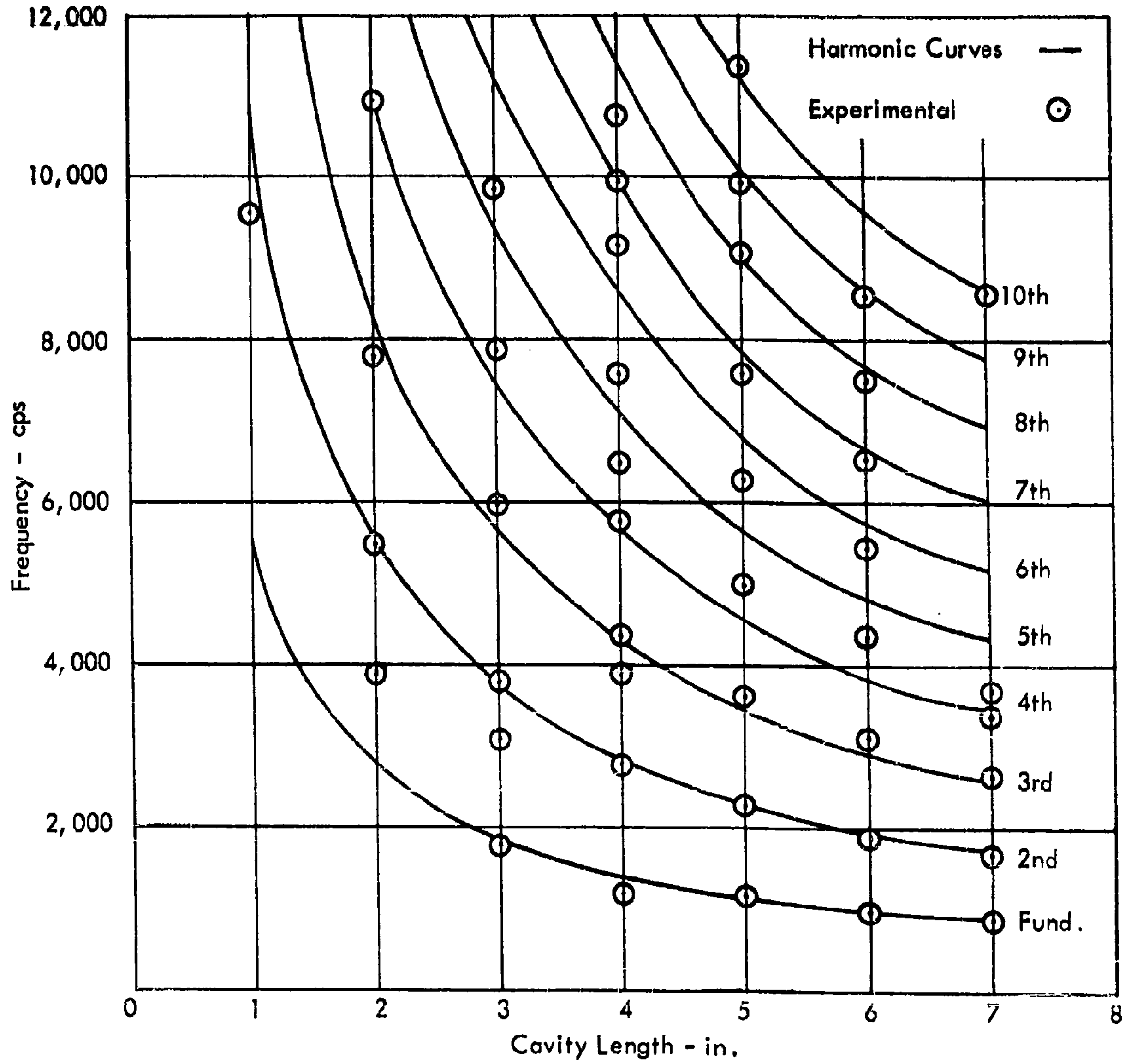


FIGURE 28. COMPOSITE PLOT OF RESONANT FRECUENCIES AT A MACH NUMBER OF 2.0

Width = 2"
Depth = 2.5"

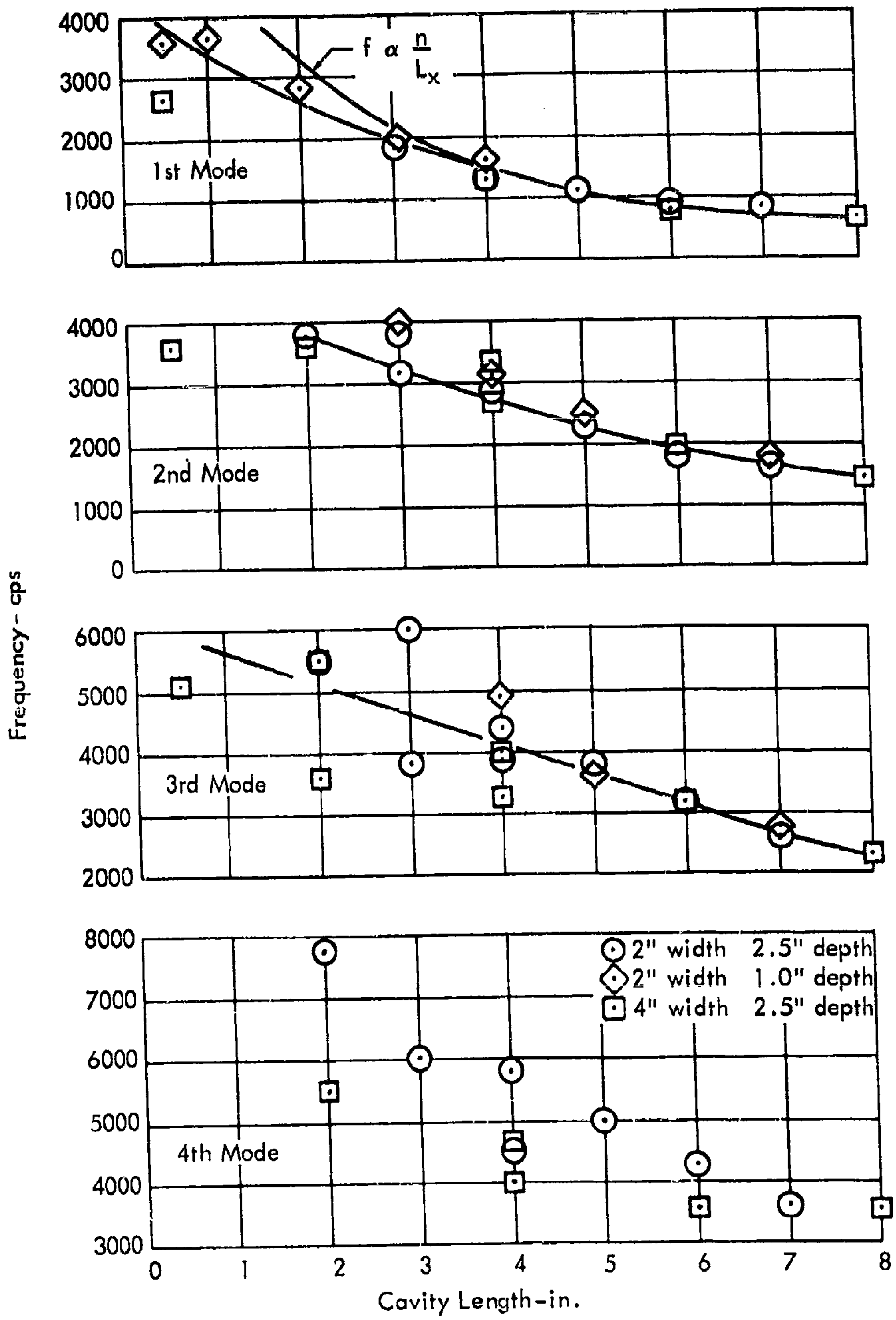


FIGURE 29. EFFECT OF CAVITY DIMENSIONS ON FREQUENCY

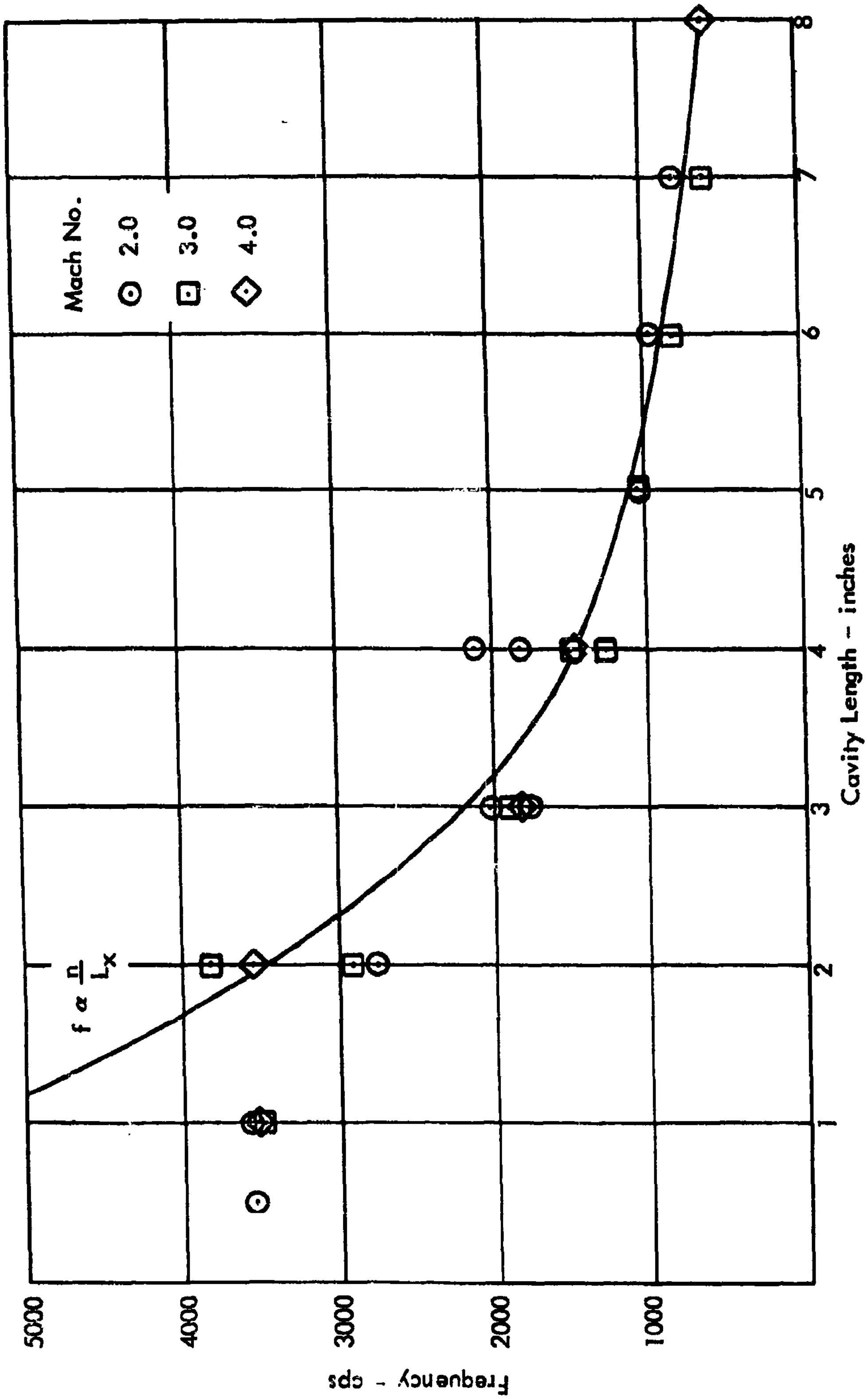


FIGURE 30. COMPOSITE VARIATION OF 1ST MODE FREQUENCY WITH CAVITY LENGTH AND MACH NUMBER. Width = 2.0" Depth = 2.5"

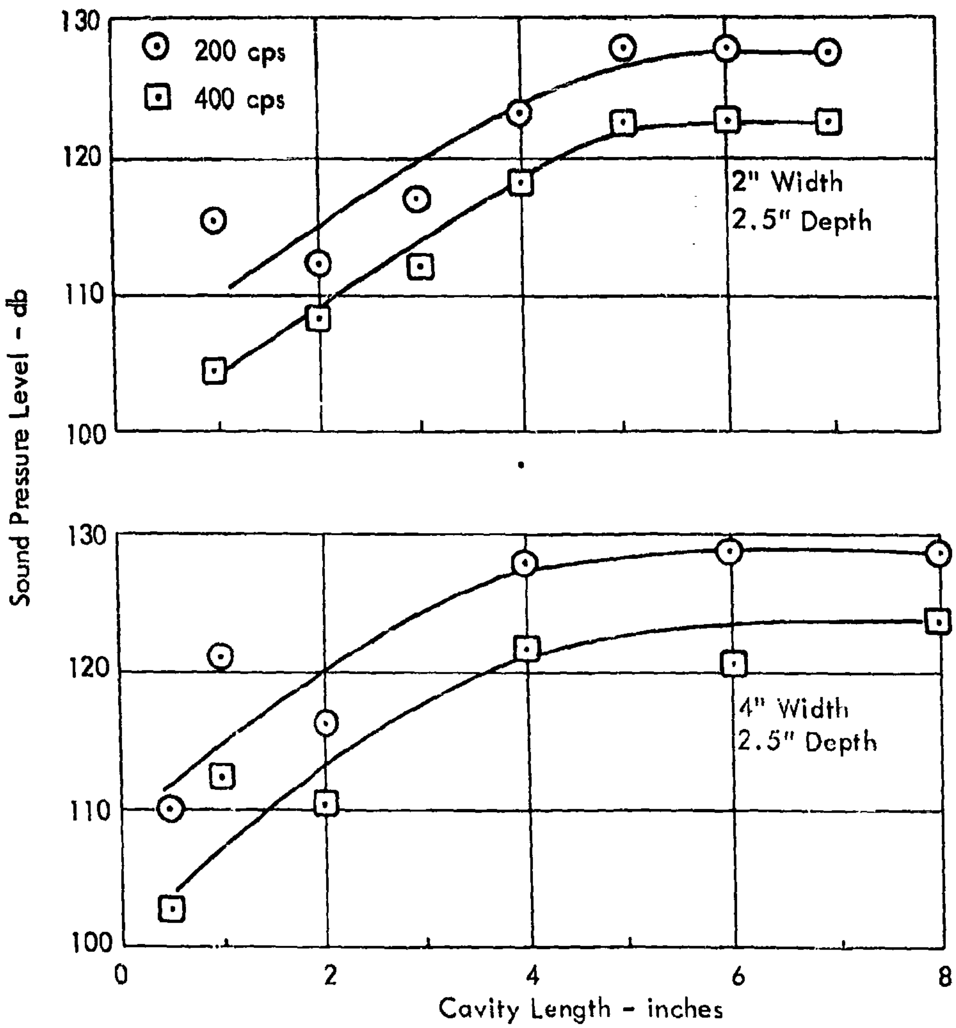


FIGURE 31. EFFECT OF CAVITY LENGTH AND WIDTH ON BUFFET RESPONSE

Mach 2

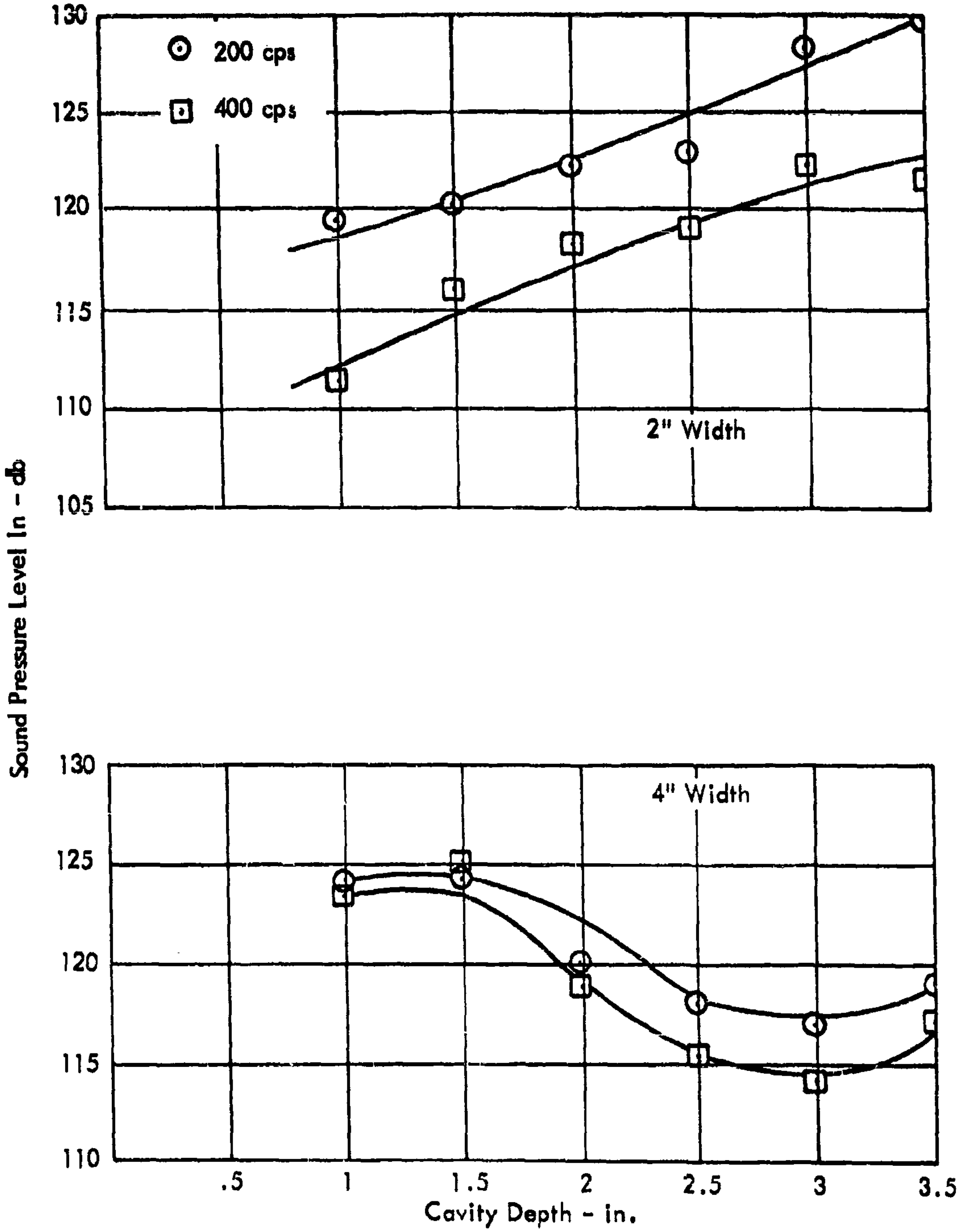


FIGURE 32. EFFECT OF CAVITY DEPTH AND WIDTH ON TYPICAL BUFFET RESPONSES

Length 8"
M = 2.0

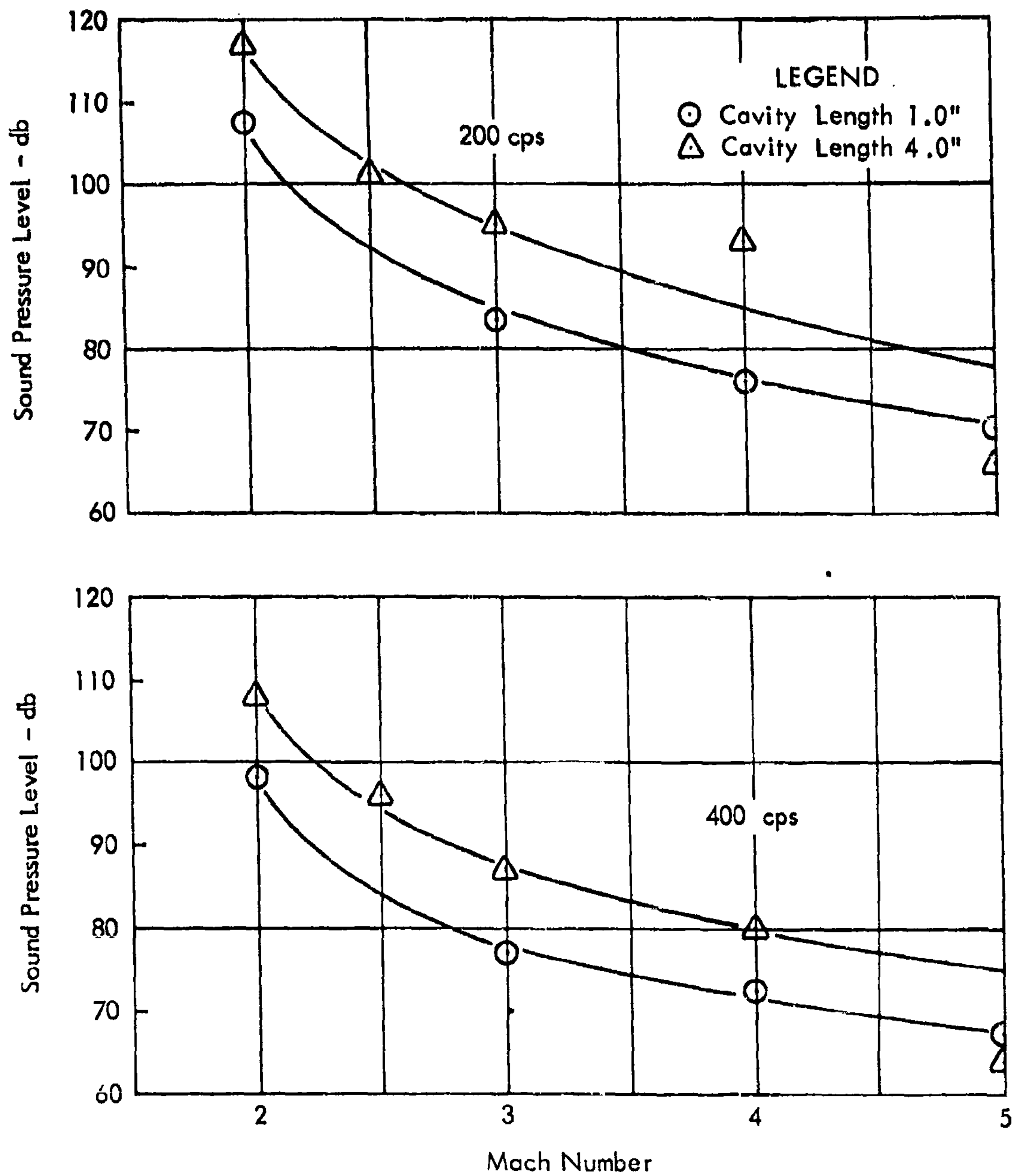


FIGURE 33. EFFECT OF MACH NUMBER ON BUFFET RESPONSE

Depth = 2.5", Width = 2.0"

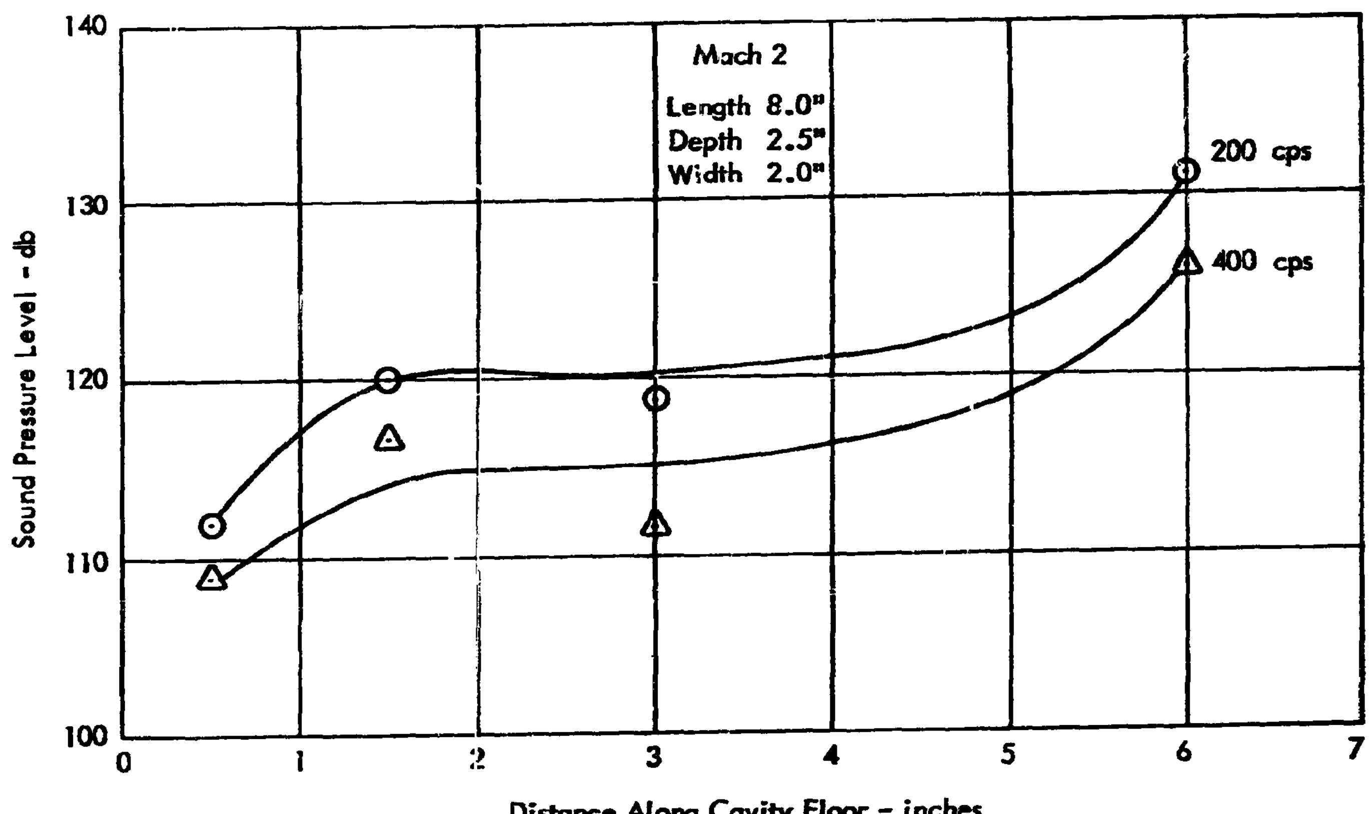


FIGURE 34. LENGTHWISE DISTRIBUTION OF BUFFET RESPONSE IN LONG CAVITY

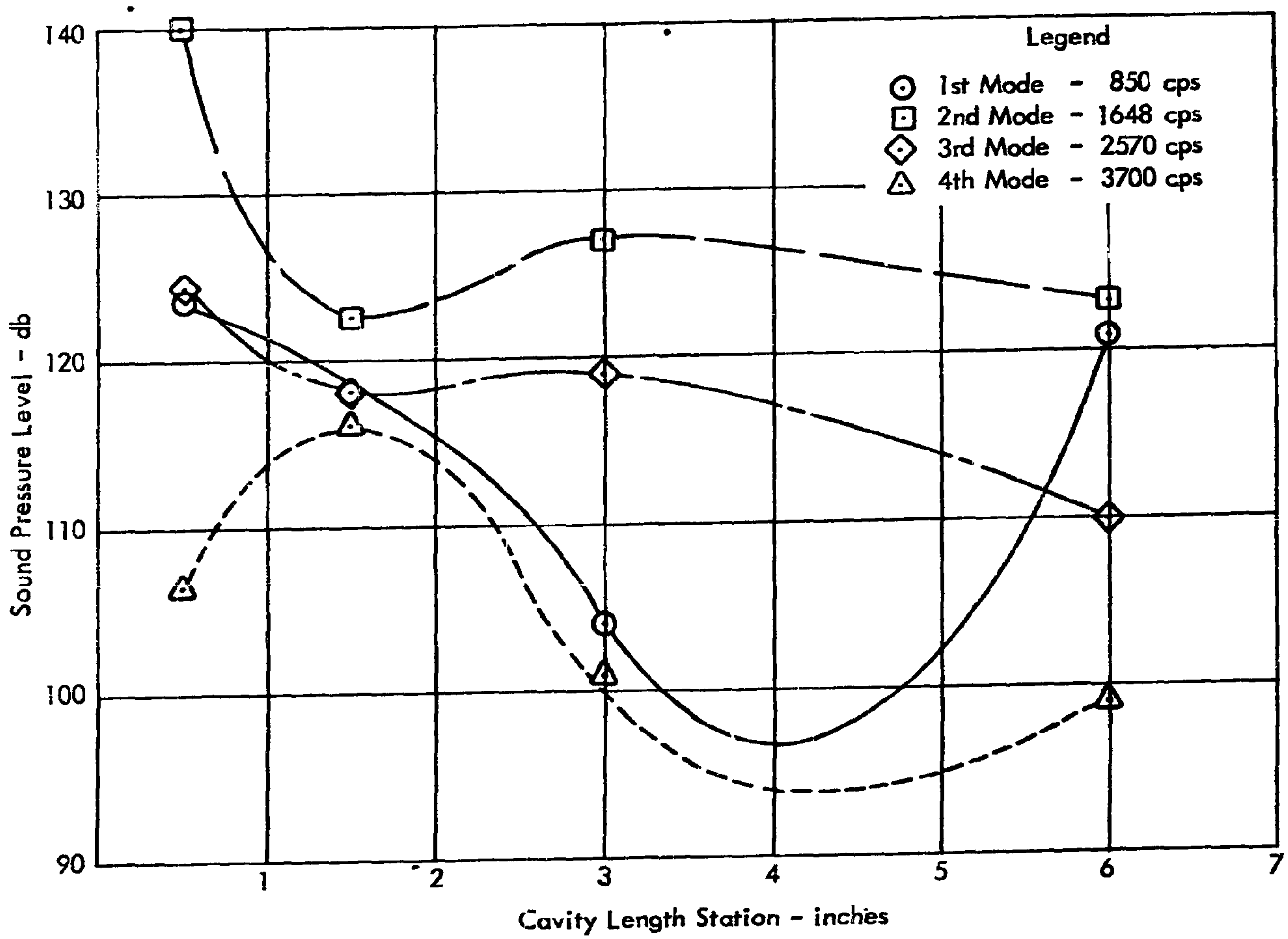


FIGURE 35. STREAMWISE DISTRIBUTION OF SOUND PRESSURE IN A LONG CAVITY-RESONANT RESPONSE

Width = 2.0", Depth = 2.5"

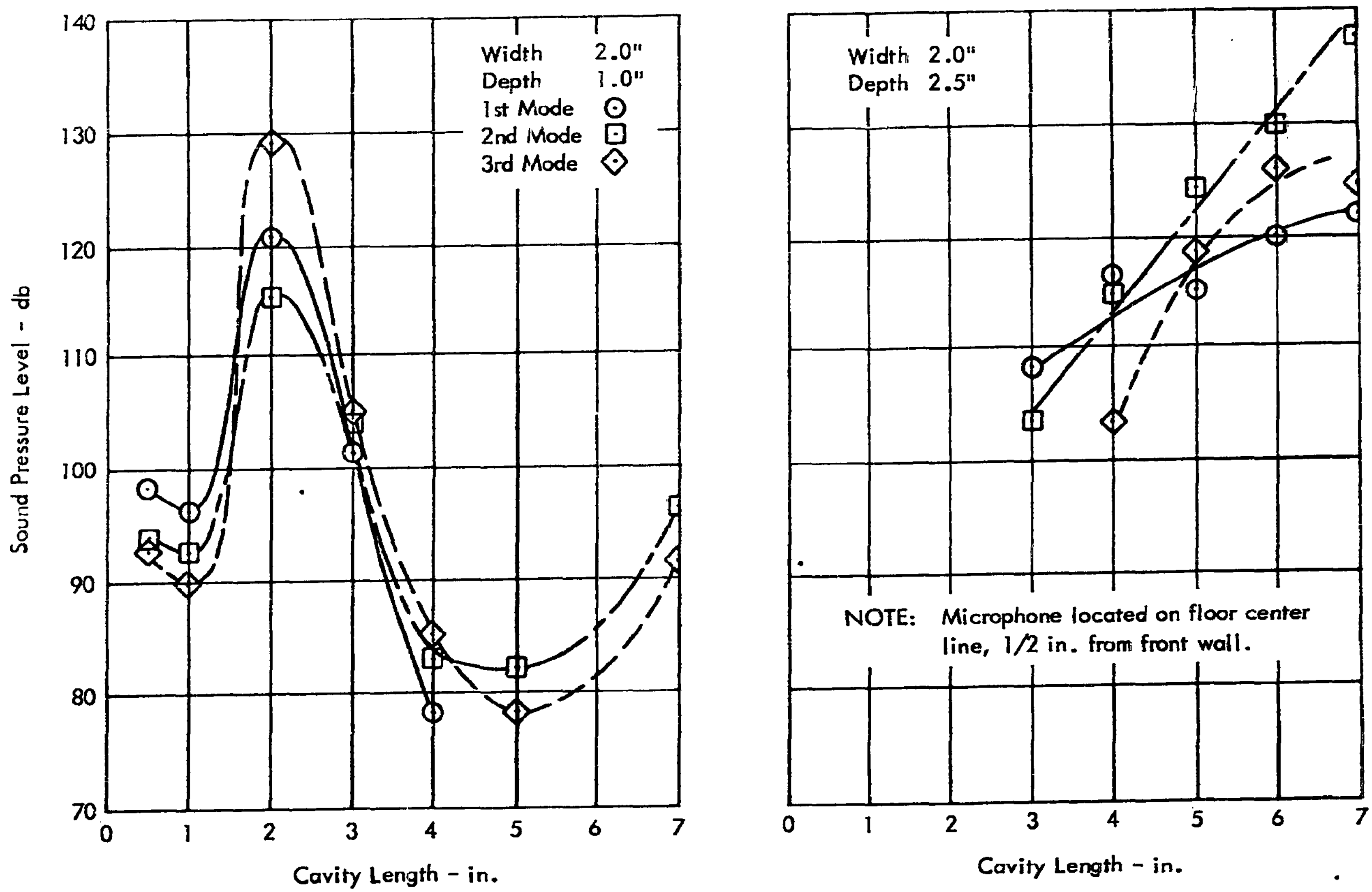


FIGURE 36 (a). EFFECT OF CAVITY LENGTH ON SOUND PRESSURE OF FIRST THREE MODES AT MACH 2.0

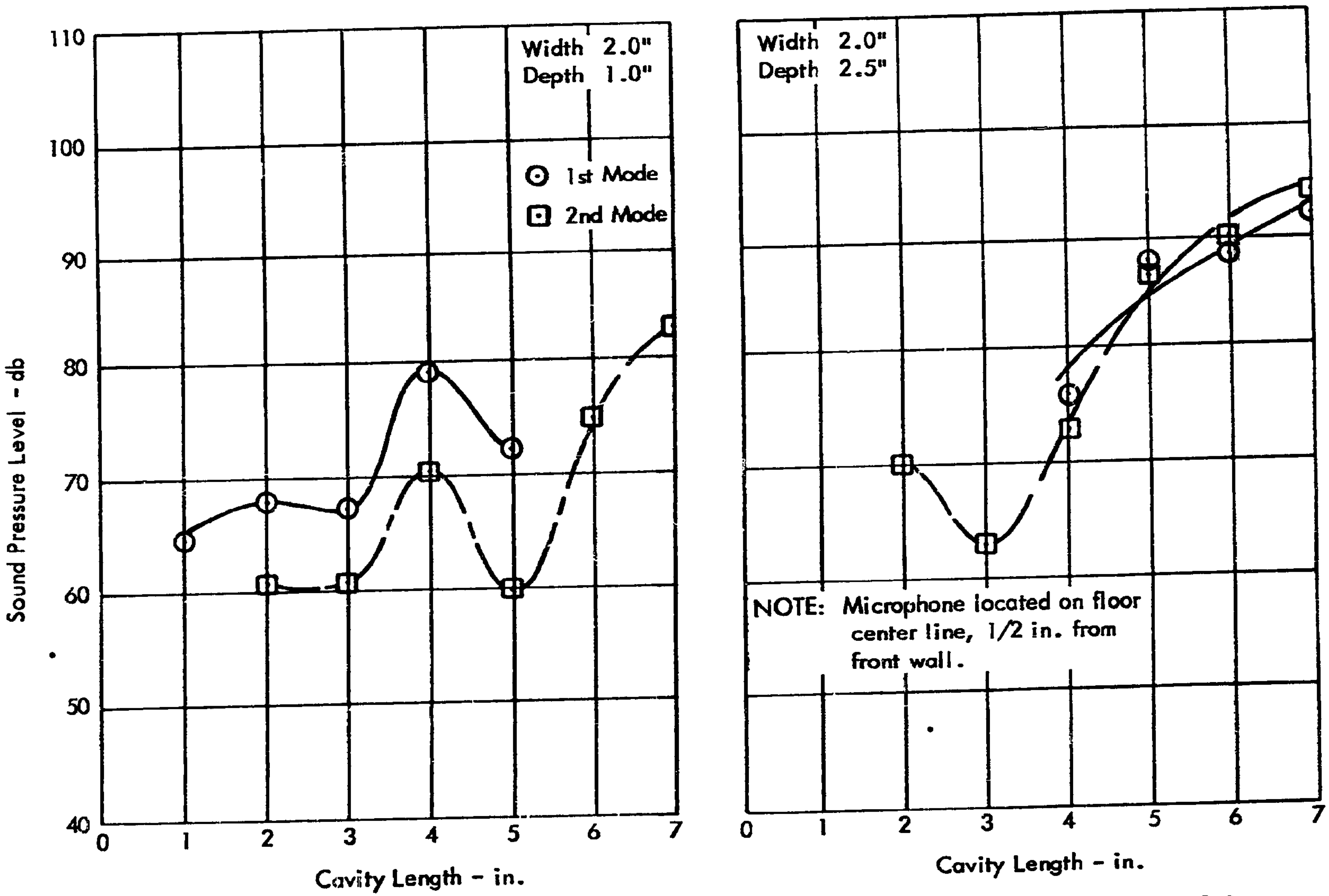


FIGURE 36 (b). EFFECT OF CAVITY LENGTH ON SOUND PRESSURE OF FIRST TWO MODES AT MACH 3.0

VI - COMPARISON OF THEORY & EXPERIMENT

In making comparisons of theory and experiment, it will be helpful to consider first the cases where the simplified theory may be expected to apply. This has the merit of considering the simpler responses first, and determining the factors which limit the range of applicability of the simplified theory. Then the more general cases, in which both depth and length modes appear, can be considered with better insight.

A. SHORT CAVITIES

1. SUBSONIC

The simplified theory is predicated on the assumption that the modes in which the cavity responds are predominately depth modes; that is, no standing waves in either the streamwise or tranverse directions are considered. While this approach would hardly be realistic for long cavities, there is evidence that it may be adequate for short cavities. To explore this possibility, consider first the data for a 1/2" length X 1" width X 1" depth cavity from the tests conducted at Lockheed.

a. Frequency

Equation (61) gives the calculated amplification of pressure which would be expected between the bottom and top of a cavity Calculation of a complete family of response curves by this equation yields the results shown in Figure 37 for Mach numbers from 0.1 to 0.9. First consider the implications of these curves. They are the following:

1) The cavity should exhibit two responses (within the frequency limits of 0-10,000 cps) at all subsonic Mach numbers.
2) The frequency of these two resonant responses should decrease slightly with Mach number.
3) The low frequency mode should predominate at all Mach numbers. However, increasing Mach number causes lower response in the low mode and a more predominant response in the higher mode.

Figure 38 gives the measured response spectrum of the 1/2" X 1" X 1" cavity throughout the subsonic regime. It is observed in the way of generalities, that the first of the above theoretical conclusions is confirmed by the data. There are two principal frequencies of response. Secondly, the experimental response frequency has a slightly increasing trend with Mach number as opposed to the theoretical prediction. Thirdly, the lower mode becomes less predominant with increasing Mach number and the second mode amplitude response increases with Mach number, however the increase is very much more predominant than predicted by the theory.

Thus, the predicted general trends are found to occur. Now consider the numerical agreement between theory and experiment insofar as response frequencies are concerned. Figure 39 gives a comparison of calculated and measured frequencies for the 1/2" X 1" X 1" cavity throughout the subsonic Mach number range. In general the agreement is rather good, particularly in the first mode. As a matter of fact, numerical agreement between theory and experiment in the 2nd. mode is also quite good up to about 0.7 Mach number, although there appears to be a divergence between the observed and calculated trends.

All factors considered, it is felt that the general and numerical aspects of the comparisons of Figure 39 support the hypothesis of a resonant response of the short cavity in its depth modes.

Now consider the situation with a longer cavity. Figure 40 gives a comparison between calculated and experimental response frequencies for the 1.5" length X 1" width X 1" depth cavity at subsonic Mach numbers. Unlike Figure 39, this does not give a depiction of all experimentally-observed frequencies for it is apparent from Figure 12 that there are frequencies in the response of this cavity which are not representative of depth modes. The intent here is to show that the simplified theory does account adequately for a part of the total response. This is evident from Figure 12, which indicates that the theory accounts reasonably well for most of the response frequencies.

A pertinent analytical result can now be considered; that is, the effect of cavity length on frequency of the depth modes. For the present this will be confined to the subsonic flow regime. Figure 41 gives the calculated variation of frequency of the first two modes of the cavities used in the exploratory tests, as cavity length is increased. A Mach number of 0.6 is considered. As a matter of interest the experimental frequencies from Figure 12 are included for comparison with theory at 0.6 Mach number.

It is observed that the first-mode frequency decreases with cavity length throughout the range of lengths considered, and this is verified by experimental results. Theoretical results for the second mode show the same trend.

b. Amplitude Response:

Equation (61) derives the amplitude response in terms of amplification of pressure in the cavity. This approach was followed in order to obtain results that are independent of the input itself, the premise being that this yields a more general theory. Such an approach is analogous to the derivation of the transfer function, or impedance of a mechanical system which can then be considered for any arbitrary input.

In the present case, however, difficulty arises in definition of the input. The boundary-layer noise existing in the flow could conceivably be viewed as the input. On the other hand, any instability of the separated boundary layer which results in time-variant displacements of the separated layer may well constitute a velocity input. In the practical case, much more convenience is associated with assessing the boundary-layer noise than the fluctuating boundary-layer displacements. For that reason it was decided to explore first the possibility of obtaining satisfactory results using boundary-layer noise as the forcing function.

In order to make the comparison of calculated and measured amplifications it will be necessary to reduce the theoretical and experimental results to a common basis of analysis. Because the input is random, the experimental response levels represent the output as integrated by the cavity over its resonant bandwidth, and the input level represents integration of a random signal over the frequency limits of the appropriate 1/3-octave filter. Theoretical results, on the other hand, are calculated in terms of response to sinusoidal input of variable frequency; as such they are the spectrum level of response.

For purposes of comparison let the amplification p/p_o be defined as:

$$p/p_o = p_{\Delta f}/p_{spect}.$$

where

p_{spect} is the spectrum level of boundary-layer noise. $p_{\Delta f}$ is the response as integrated over the theoretical half-power limits of the frequency response characteristic.

Let it further be assumed that the 1/3-octave response level for the output is entirely composed of $P_{\Delta f}$, having no contributions from frequencies outside these limits. The theoretical results can then be put on a comparable basis with experimental results and plotted. Figure 42 gives such a plot for the first and second modes of the 1/2" X 1" X 1" cavity, where the amplifications shown are (1/3 octave)/p_{spect}).

The indications of this figure are quite encouraging. For both the first mode and the second mode the agreement between theory and experiment is quite good. Actually, it would appear that the implications of this agreement are of more consequence than the agreement itself, for the use of boundary-layer noise as the forcing function seems to be a realistic and satisfactory practice. As mentioned above, this will permit much better utilization of the results since both the characteristic spectrum and intensity variations of boundary-layer noise are now fairly well catalogued in the literature.

It should be noted that because the simplified theory considers only depth modes, the streamwise distribution of pressure within the cavity is constant. That is, the pressure at any point on the cavity floor is theoretically the same. Of course, pressure will vary on all vertical surfaces, with a maximum occurring at the bottom of the cavity and a minimum at the top.

2. SUPERSONIC

a. Frequency

Figure 43 gives a comparison of experimental response-frequencies with calculated frequencies for the 2" length X 2" width X 2.5" depth cavity at Mach numbers from 1.75 to 5.0. Consider first the theoretical results. Four modes were found to exist at frequencies below 10 kc in most cases. These are non-harmonic. Unlike the results at subsonic Mach numbers, the frequency of a given mode does not vary appreciably with Mach number.

The data points indicated by squares are seen to follow the theory curves very closely. Several interesting points arise in this regard. For example, the theory predicts the first mode to occur in the vicinity of 1800 to 2000 cps, but no resonant response was observed at this mode. The reason apparently lies in the amplification; although the theory indicates the presence of the mode, it also indicates extremely small amplifications. The calculated amplification was only of the order of 0.5db as a maximum. In view of this, it is not surprising that the experimental response spectra do not show such a resonance.

It is interesting to note also that for this cavity not only are all depth modes predicted accurately by the theory, but these are the only responses which appear in the measured spectrum. Thus the theory adequately predicts the entire frequency response of this cavity at all Mach numbers.

b. Amplitude Response

Figure 44 indicates the measured and calculated amplitude response of the 2" length X 2" width X 2.5" depth cavity at all Mach numbers tested. In general, the calculated spectrum of amplification shows agreement with the experimental spectrum in its frequencies, as was indicated by Figure 43, but the agreement in amplification is rather poor except for the Mach 3 case. In this case the amplifications are in fair agreement for the 1st and 3rd modes. The experimental amplification of the 2nd mode is much higher than calculated, but judging from the sharpness of the response curve, a part of this may be due to the filter bandwidth used in analysis. The spectrum shape is indicated correctly only if the width of the resonant peak is large relative to the bandwidth of the filter used in analysis (50 cps). This does not appear to hold for the second mode, hence the filter output may be taken as indicative of the response integrated over its own bandwidth.

Further comparison of theory and experiment is afforded by Figure 45, which considers shorter cavities at a Mach number of 2.0. Cavities of 1" length and 0.5" length are considered for a constant width of 2" and depth 1". In both of these cases the agreement is considered to be rather good, particularly for the 1" length.

The results of Figures 44 and 45 tend to add further confirmation to the conclusion that the simplified theory is adequate only for cases wherein length/depth is less than unity.

B. LONG CAVITIES

The experimental evidence presented herein indicates that in cavities of length-to-depth ratios greater than approximately one, there is significant response of the cavity in its length modes. There may also be excitation of depth modes, as was shown to be the case at $L_x/L_z = 1.5$ in the exploratory tests, but predominance of the length modes is to be expected.

Consider the cavity of 8" length, 2" width, and 3.5" depth. Figure 46 gives a comparison of the calculated and measured sound-pressure spectra at a point on the bottom of the cavity 0.5 inches from the leading edge at a Mach number of 2.0. The theoretical spectrum is calculated from Eq. (58). In order to obtain absolute values for the calculated pressure spectrum, it is necessary to obtain either a theoretical or an empirical value of source strength A. In the present case A was evaluated empirically as follows:

At distances $r >> \lambda$ from the source, the sound pressure can be written as

$$p_p \approx \frac{i\omega\rho A e^{-i\omega t}}{4\pi r}, \quad p_{rms} \approx \frac{\omega\rho A}{4\pi r\sqrt{2}}$$

The spectrum of pressure response at the point of interest in the cavity was observed at a high frequency (6000 cps), which was off resonance. At such a frequency the requirement that $r >> \lambda$ is at least approximated, since λ = 2.2 inches and (r) avg. = 5.2 inches, assuming the source to be located at random in the plane of the cavity opening. From the spectrum - level pressure at 6000 cps and the average r, the source strength was computed as $A_{6000\ cps}$ = 46.8 cm^3/Sec.

To be useful, the spectrum of source strength must be determined. In view of the relatively flat slope of the turbulence spectrum shown in Figure 14 it was hypothesized that

$$A(\omega) = \text{constant} = 46.8$$

for the case under consideration; i.e., a constant-velocity source is assumed..

Within the limitations of the assumptions made regarding source strength and characteristics, Figure 46 indicates reasonably good agreement between calculated and measured spectra. While there are some appreciable differences between theoretical and experimental amplitudes, it seems clear that the phenomenon of cavity response is correctly defined by the theory.

Some further insight into the phenomena is afforded by the tabulation below, which compares calculated and measured resonant frequencies and identifies the nature of each by its modal description

RESONANT FREQUENCIES, 8" L X 2" W X 3.5" D

$f_{cal.}$	f_{meas}	Modal Description		
600	560	$n_x = 1$	$n_y = 0$	$g_n = g_o$
800	--	$n_x = 2$	$n_y = 0$	$g_n = g_o$
1450	1350	$n_x = 1$	$n_y = 0$	$g_n = g_1$
2200	2250	$n_x = 2$	$n_y = 0$	$g_n = g_1, g_2$
3250	3150	$n_x = 3$	$n_y = 0$	$g_n = g_c$
4050	4000	$n_x = 1, 4$	$n_y = 0$	$g_n = g_o, g_2$
4550	4850	$n_x = 5$	$n_y = 0$	$g_n = g_o$
5600	5600			
--	6550			
7600	7000			

An interesting point arises in connection with the first two calculated frequencies. Theoretically, two resonances should occur, at 600 cps and at 800 cps. In this case only one resonance is indicated. However, Figure 27 shows that in many cases the analyses are made with sufficient definition (50 cps) to distinguish between the two modes in the way of a double-peaked curve.

Figure 47 gives a similar comparison of theory and experiment for a 4" length X 2" width X 2.5" depth configuration. In this case, the resonant frequencies may be identified as follows:

RESONANT FREQUENCIES, 4" L X 2" W X 2.5" D

$f_{cal.}$	$f_{meas.}$	Modal Description		
1250	1325	$n_x = 1$	$n_y = 0$	$g_n = g_3$
1800	- -	$n_x = 0, 1$	$n_y = 0, 0$	$g_n = g_o$
2450	2700	$n_x = 1$	$n_y = 0$	$g_n = g_1$
3950	3850	$n_x = 2$	$n_y = 0$	$g_n = g_o$
4400	4250	$n_x = 1, 2$	$n_y = 0$	$g_n = g_2, g_o$
5250	5750	$n_x = 1$	$n_y = 0$	$g_n = g_2$
6000	6500	$n_x = 2$	$n_y = 0$	$g_n = g_1$
7600	7600	$n_x = 2$	$n_y = 0$	$g_n = g_3$

The comparison of theoretical and experimental response spectra given in Figure 47 indicates reasonably good agreement for the lower-order modes. At the higher modes the theoretical spectrum tends to overemphasize the response. In this regard, it should be noted again that the theoretical spectrum shape is directly related to the assumed spectral distribution of A, and the absolute pressure levels are directly related to the magnitude taken for A. Obviously the evaluation of A from the sound pressure on the cavity bottom will over estimate source strength by virtue of the reverberant characteristics of the enclosure, which reinforces the pressure above the assumed free-space level.

Further uncertainty exists in the hypothesized spectral envelope of A. As discussed previously, the calculations depicted in Figure 46 and 47 are based on a source strength which is independent of frequency, since the spectrum of turbulence was found to approximate this condition.

On the other hand, the envelope of sound pressure measured in the boundary layer follows more nearly a $1/\omega$ type of variation. Thus the assumption that $A(\omega) \propto 1/\omega$ may well be a better approximation to the actual conditions. Certainly this would yield a more representative response envelope as judged from the measured envelopes.

A further point regarding the higher-order modes is that appreciable air dissipation will increase the damping at the frequencies involved here. Since this is not accounted for theoretically, some overestimation of the higher order modes is probably to be expected.

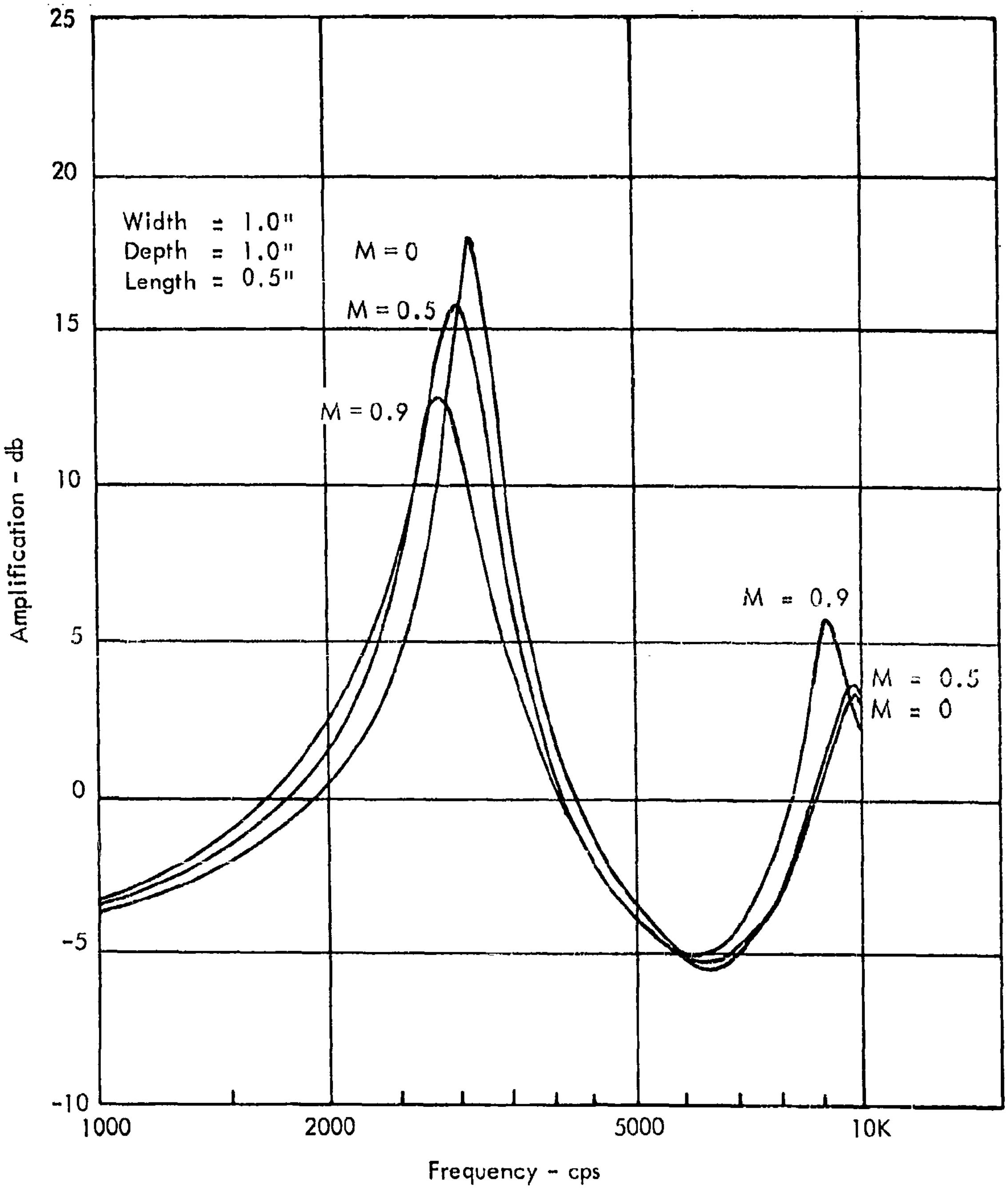


FIGURE 37. THEORETICAL AMPLIFICATION OF SHORT CAVITY

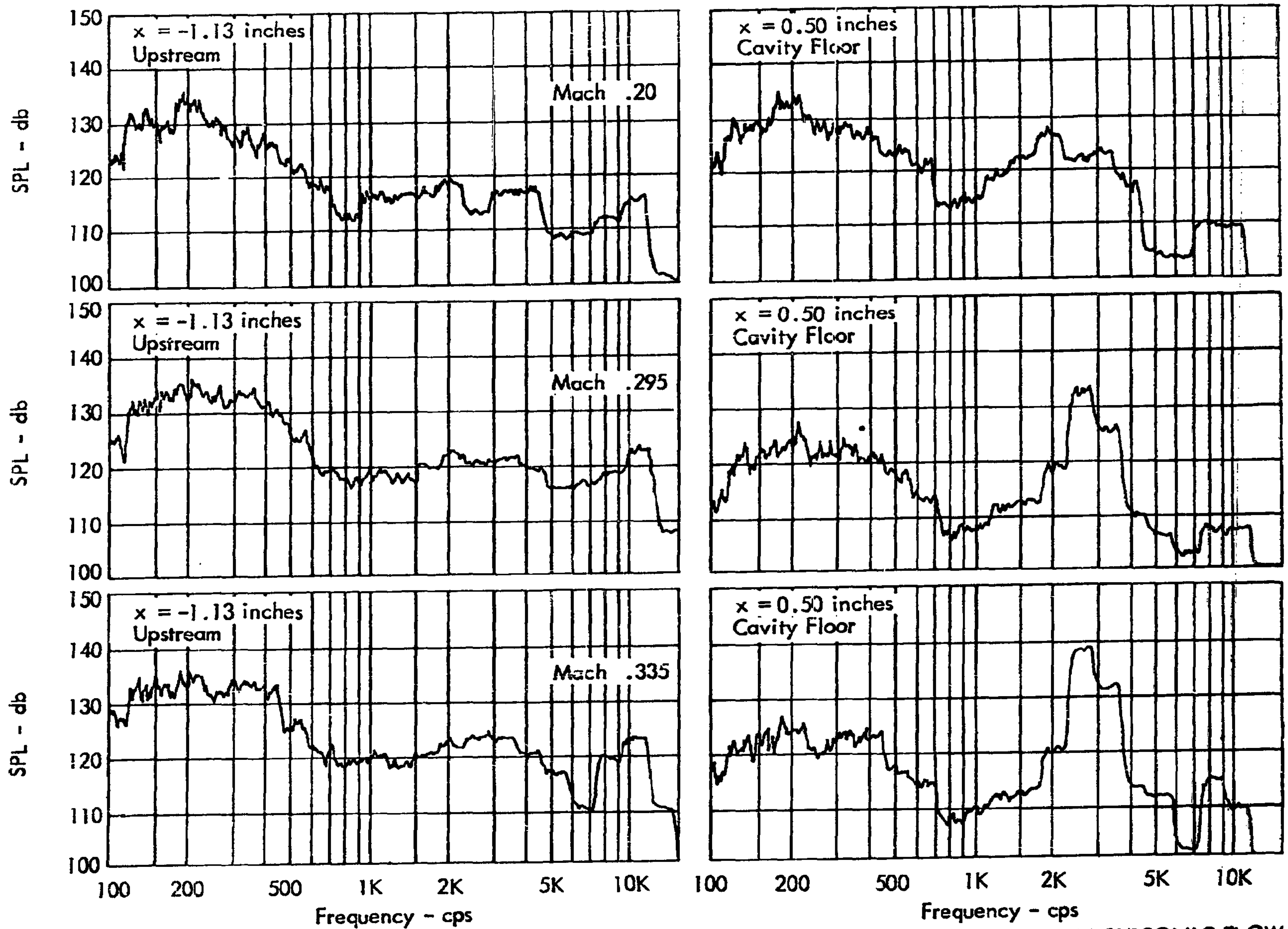


FIGURE 38. EXPLORATORY RESPONSE SPECTRA OF A 1/2" LENGTH X 1" WIDTH X 1" DEPTH CAVITY IN SUBSONIC FLOW

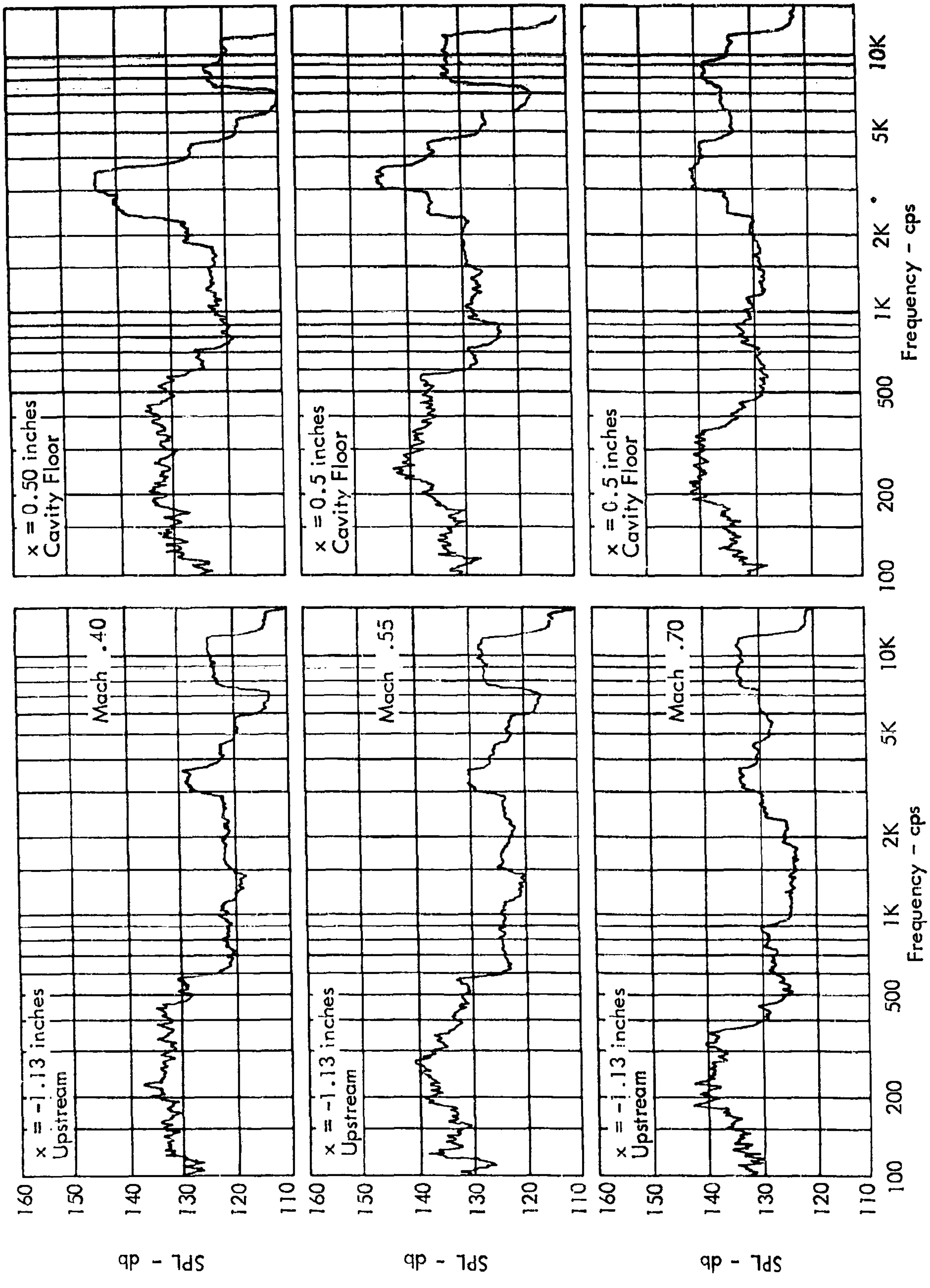

x = -1.13 inches
Upstream
Mach .40
Mach .55
Mach .70
x = 0.50 inches
Cavity Floor
x = 0.5 inches
Cavity Floor
160
150
140
130
120
110
SPL - db
100
200
500
1K
2K
5K
10K
Frequency - cps

FIG. 38. (Contd.)

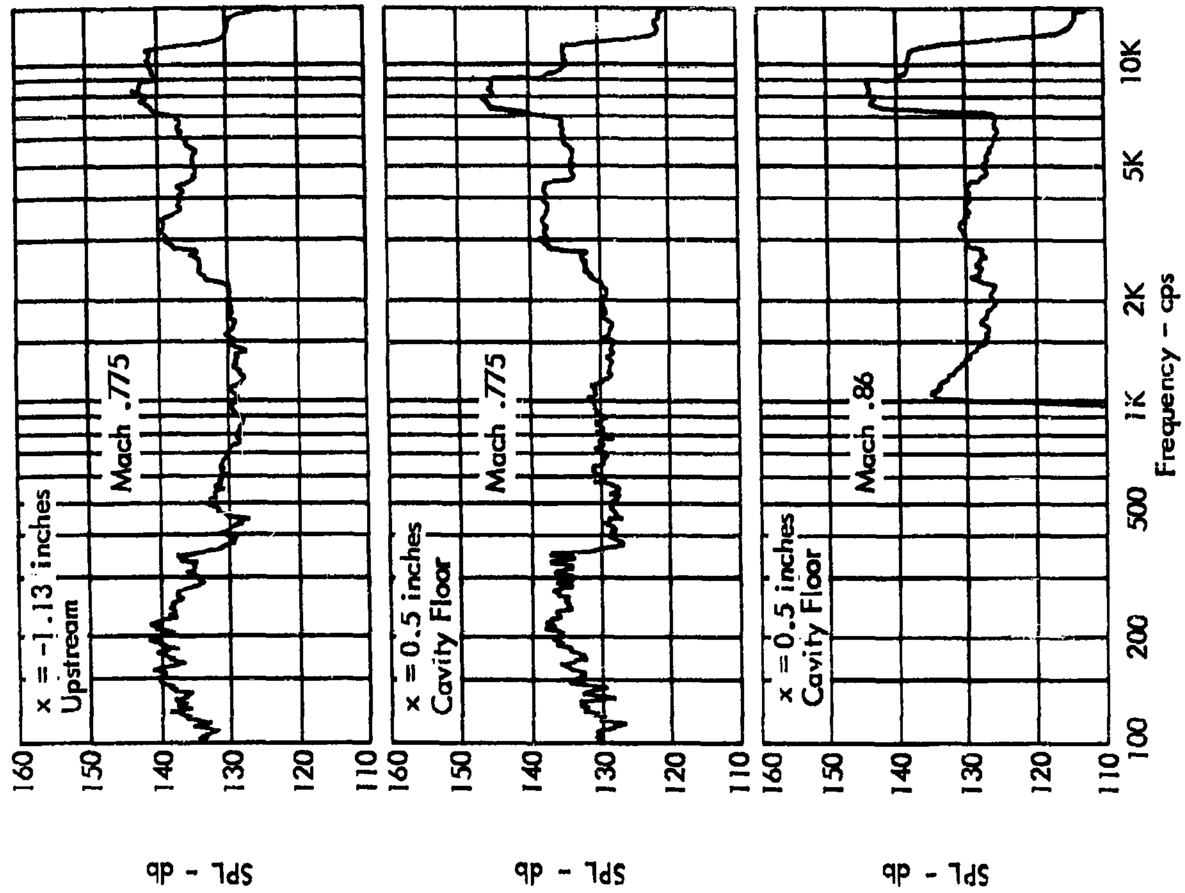


FIGURE 38. (Contd.)

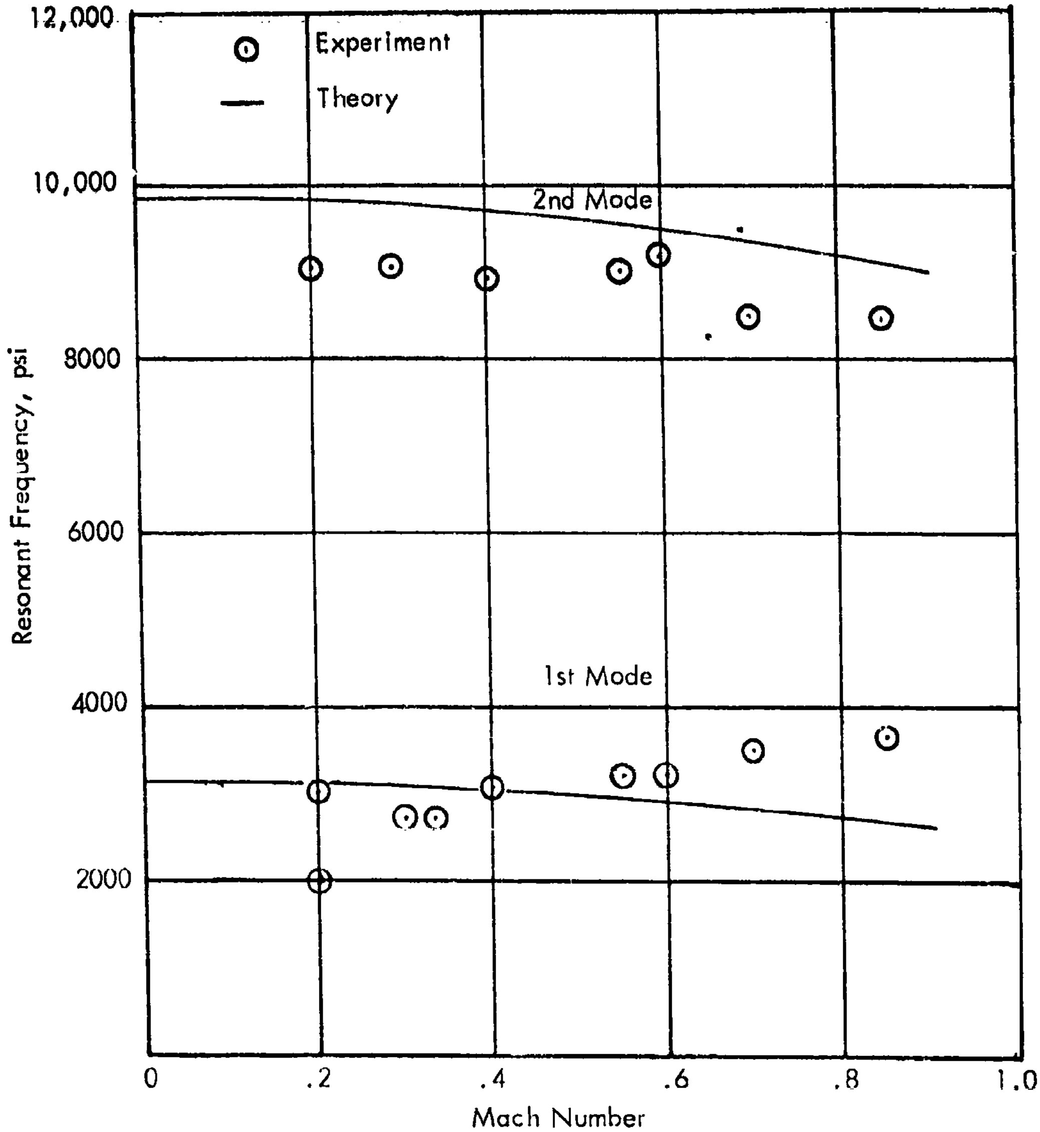


FIGURE 39. COMPARISON OF THEORETICAL AND EXPERIMENTAL RESPONSE FREQUENCIES FOR SHORT CAVITY

Length = 0.5"
Width = 1.0"
Depth = 1.0"

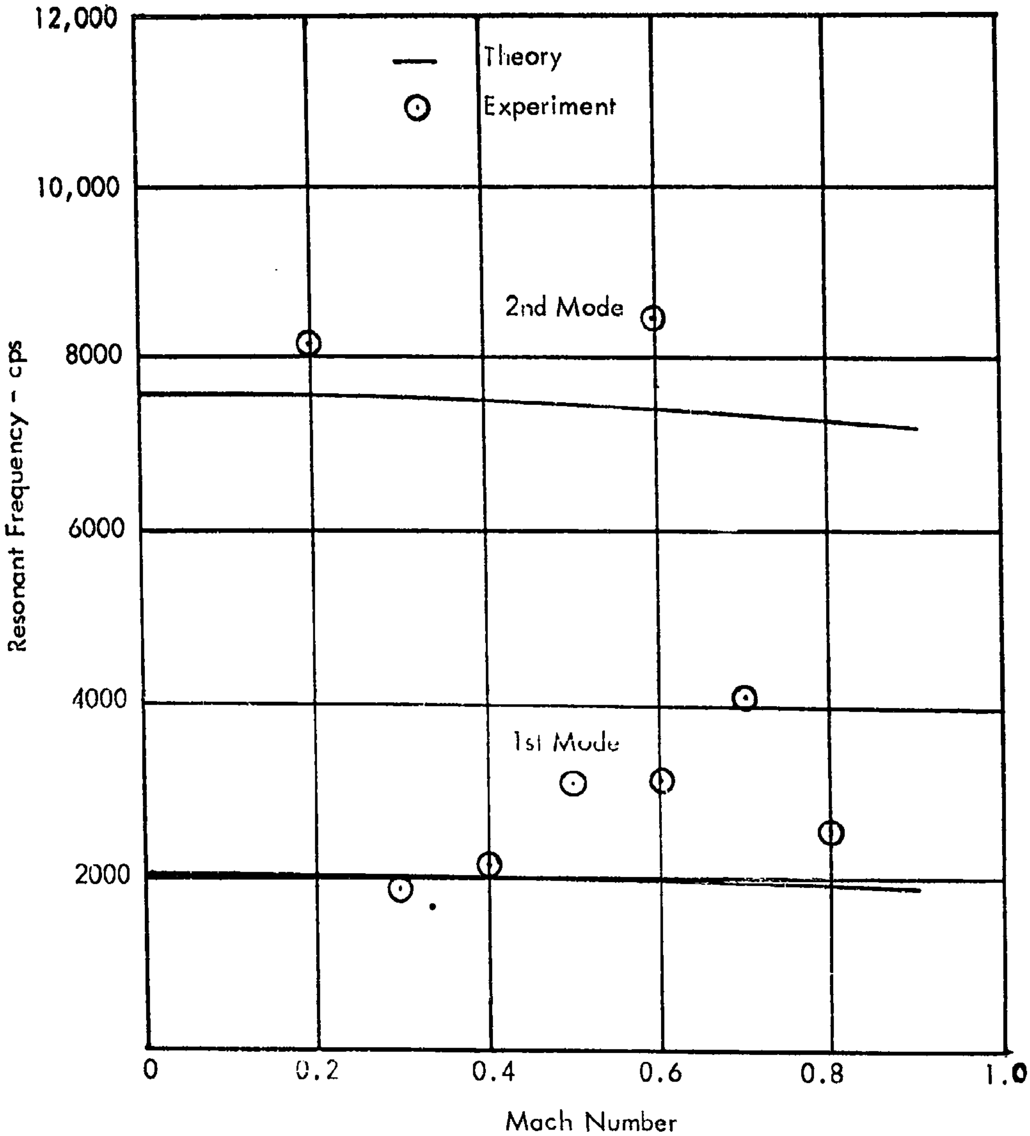


FIGURE 40. COMPARISON OF THEORETICAL AND EXPERIMENTAL RESPONSE FREQUENCIES

Length = 1.5"
Depth = 1.0"
Width = 1.0"

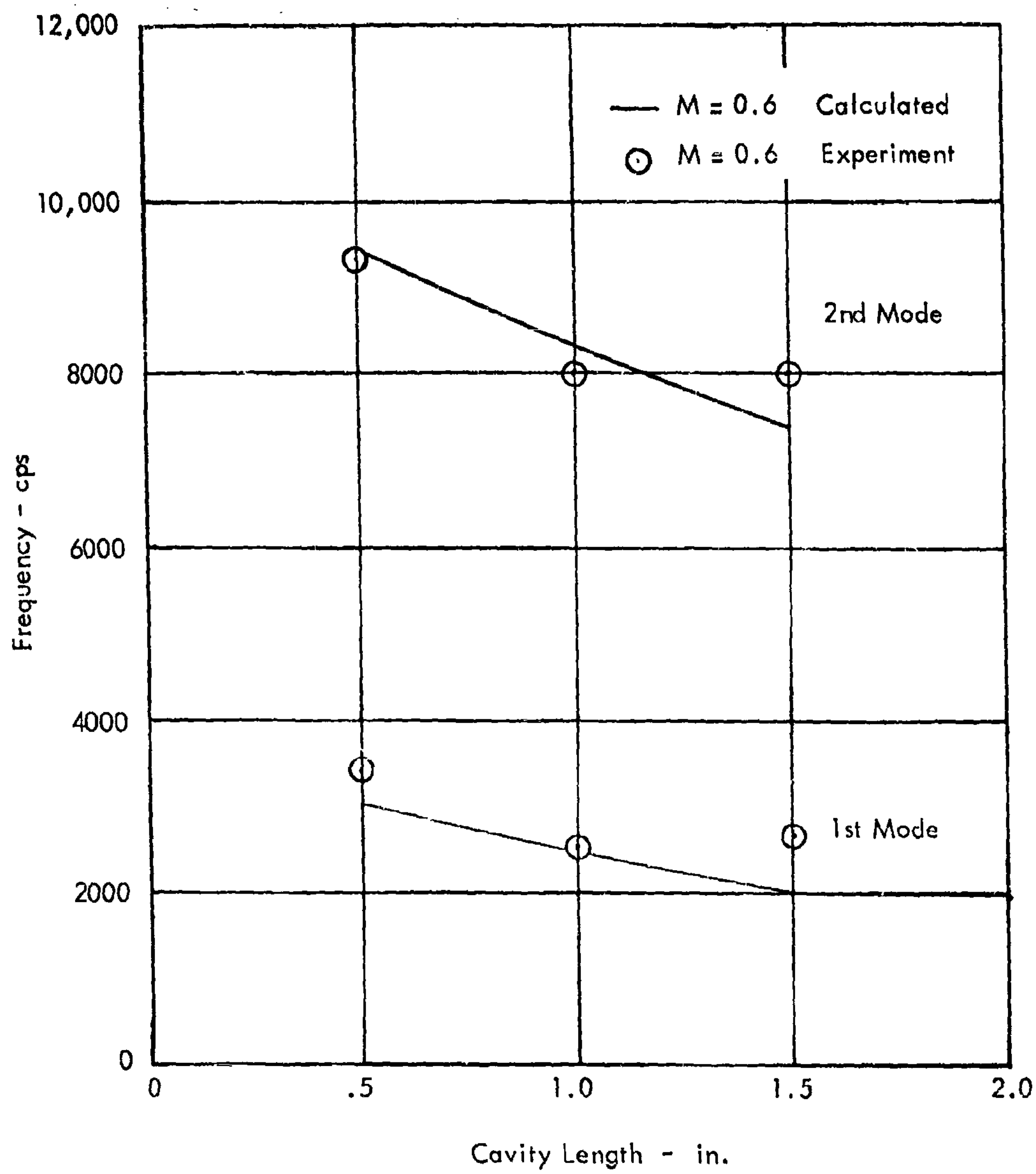


FIGURE 41. THEORETICAL EFFECT OF CAVITY LENGTH ON FREQUENCY OF DEPTH MODES

Width = 1.0"
Depth = 1.0"

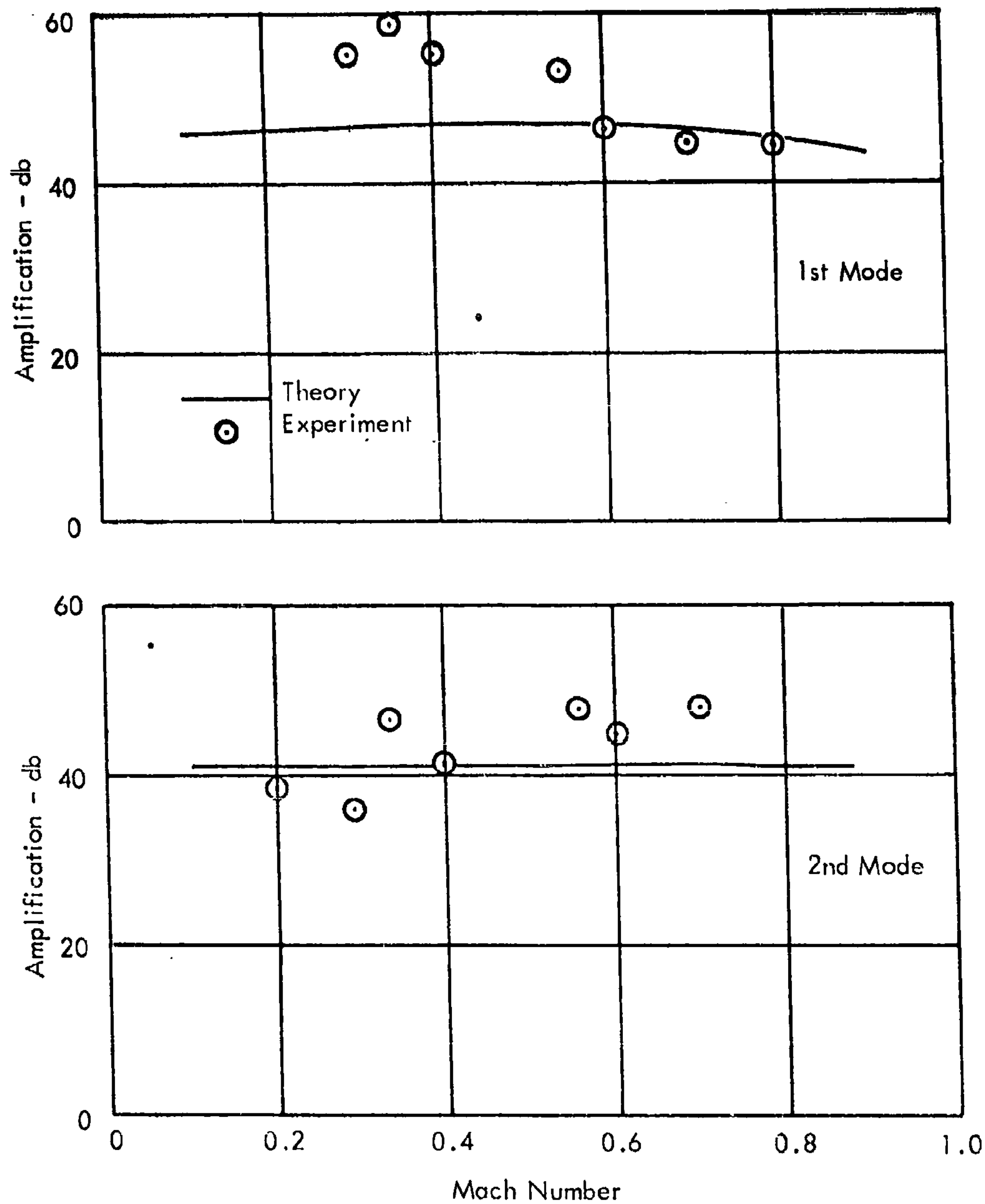


FIGURE 42. COMPARISON OF THEORETICAL AND EXPERIMENTAL AMPLITUDE RESPONSE

Length = .5"
Width = 1.0"
Depth = 1.0"

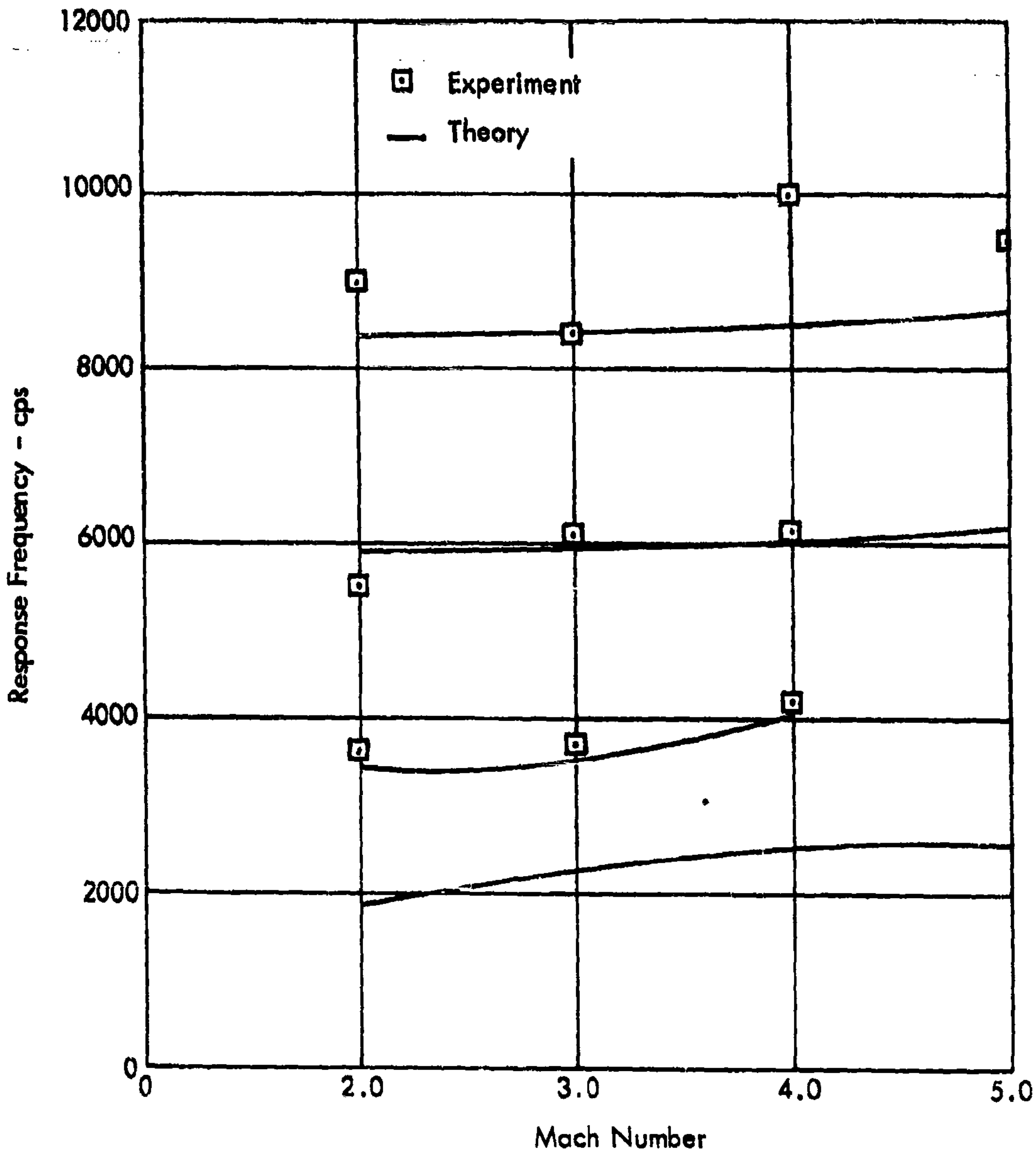


FIGURE 43. COMPARISON OF THEORETICAL AND EXPERIMENTAL RESPONSE FREQUENCY FOR A 2" LENGTH X 2" WIDTH X 2.5" DEPTH CAVITY AT SUPERSONIC MACH NUMBER.

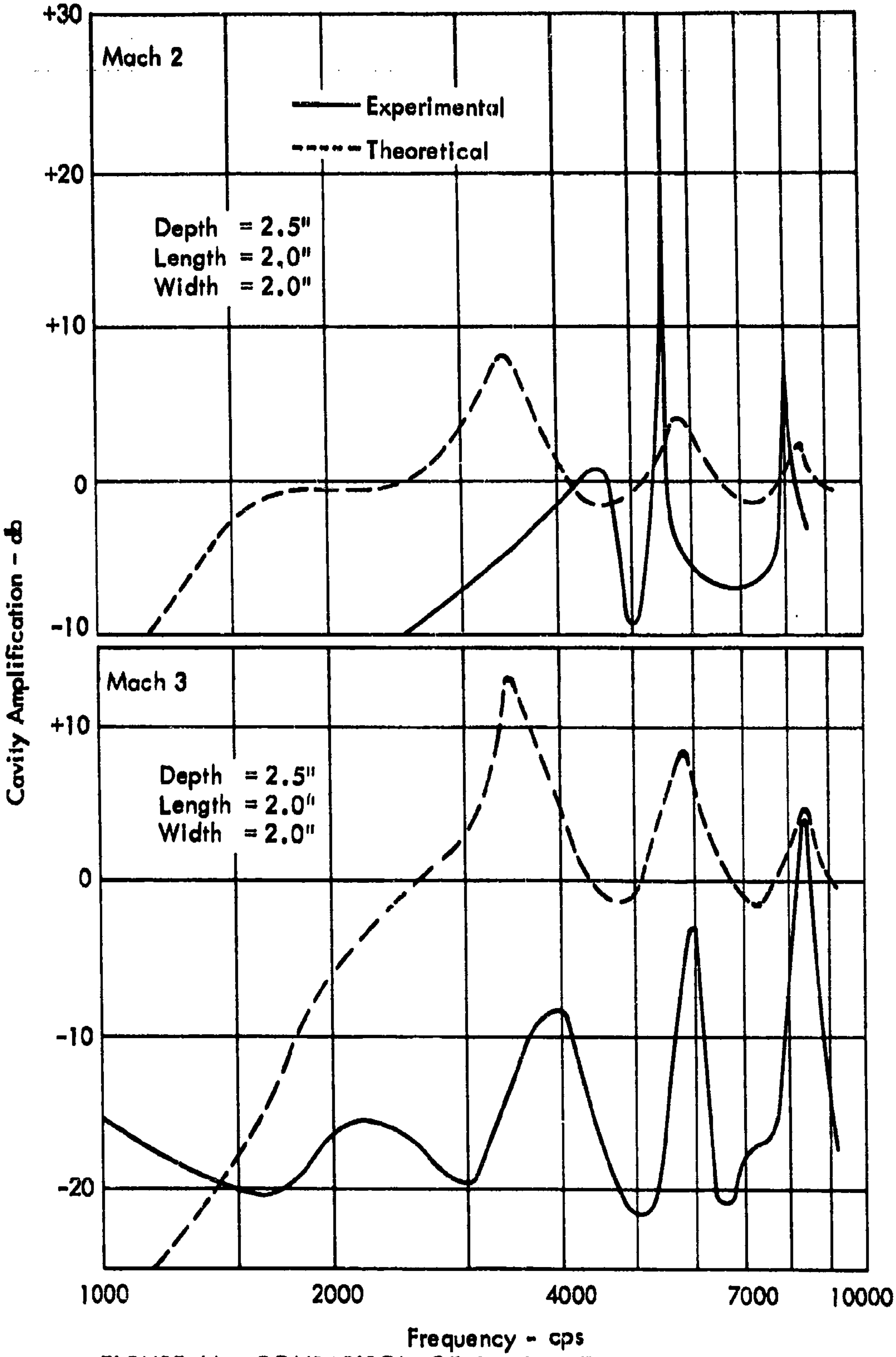


FIGURE 44. COMPARISON OF CALCULATED AND MEASURED RESPONSE SPECTRA

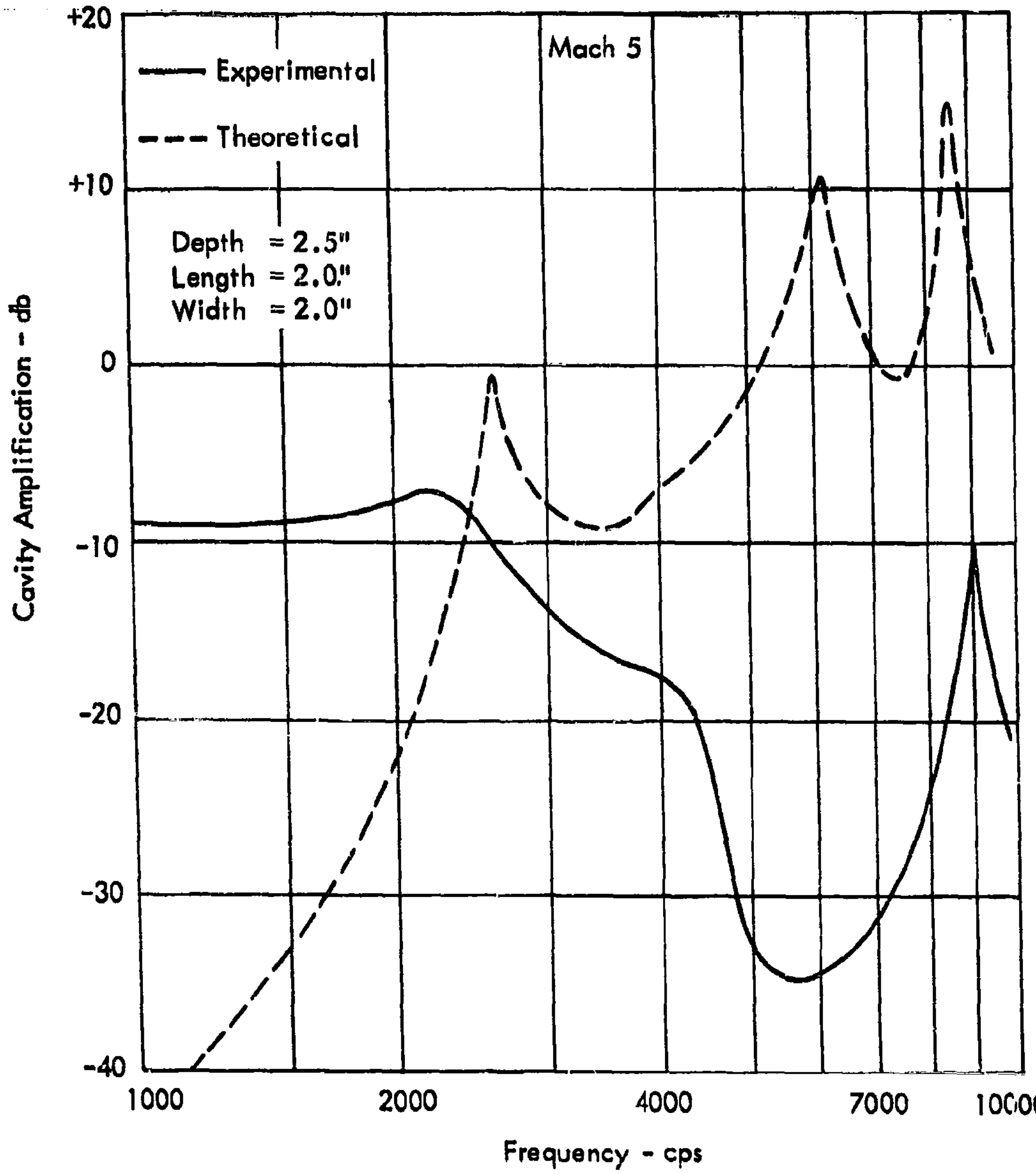


FIGURE 44. (Cont'd)

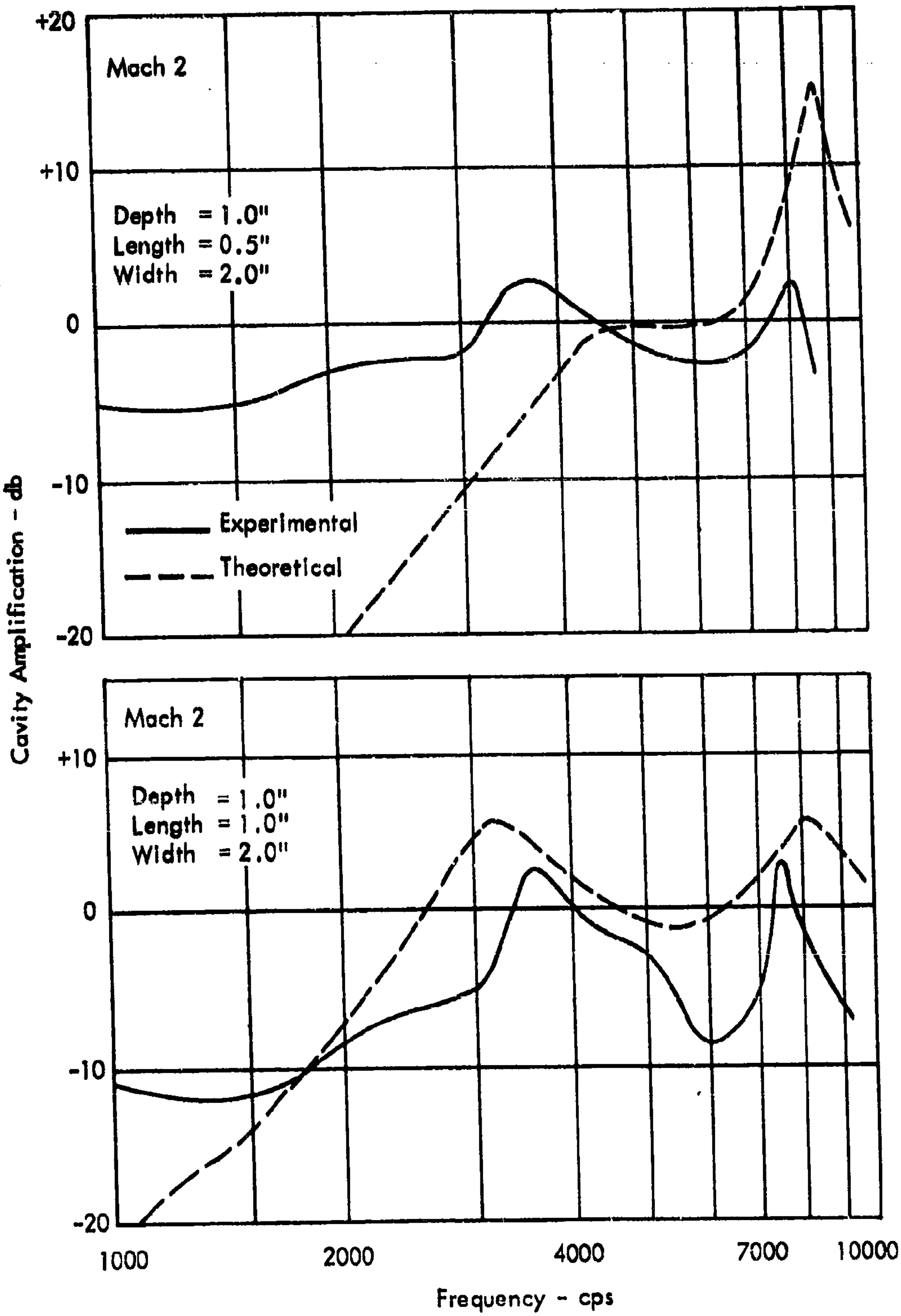


FIGURE 45. FURTHER COMPARISON OF CALCULATED AND MEASURED RESPONSE SPECTRA

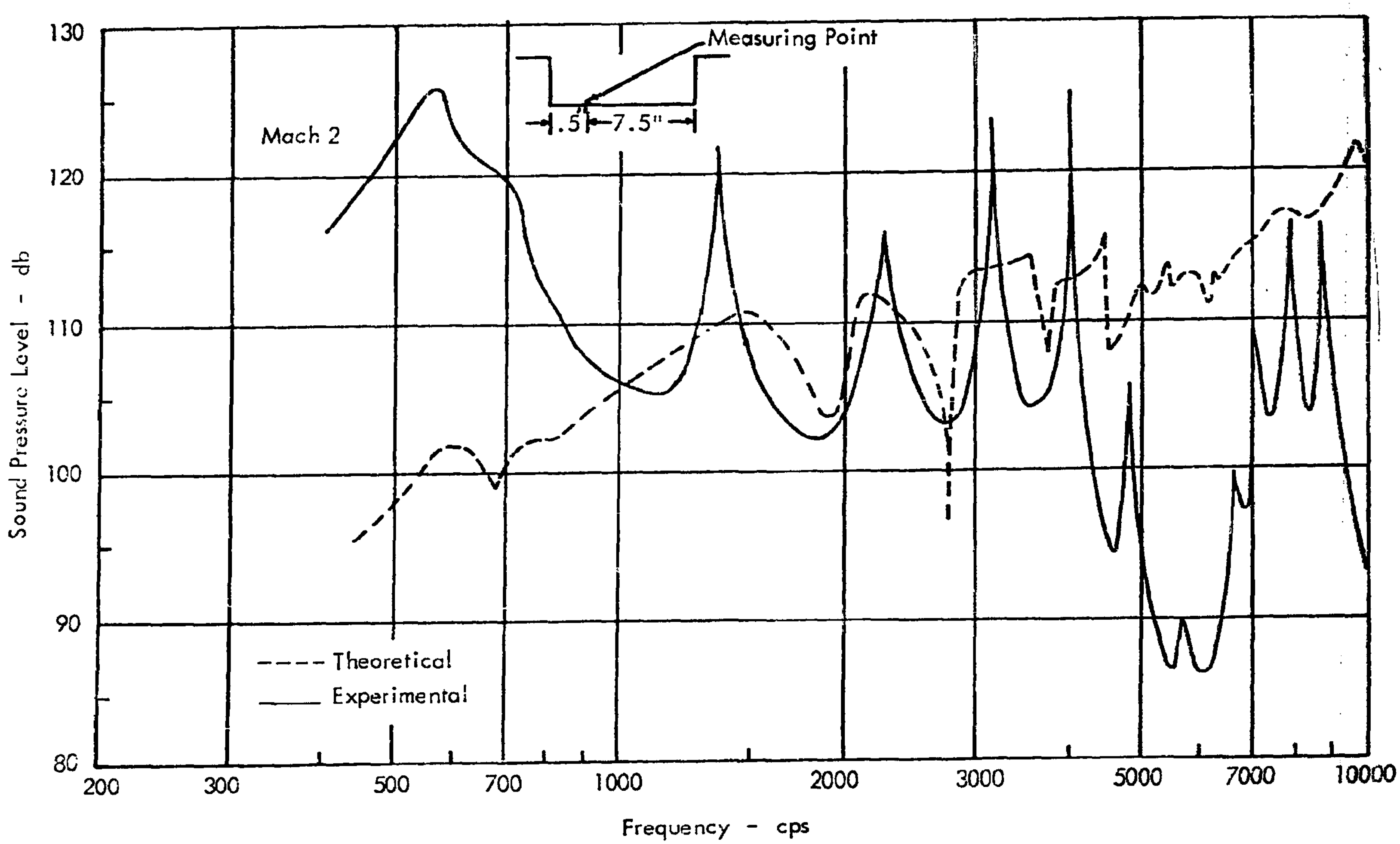


FIGURE 46. COMPARISON OF CALCULATED AND MEASURED RESPONSE SPECTRA OF A 8" LENGTH X 2" WIDTH X 3.5" DEPTH CAVITY.

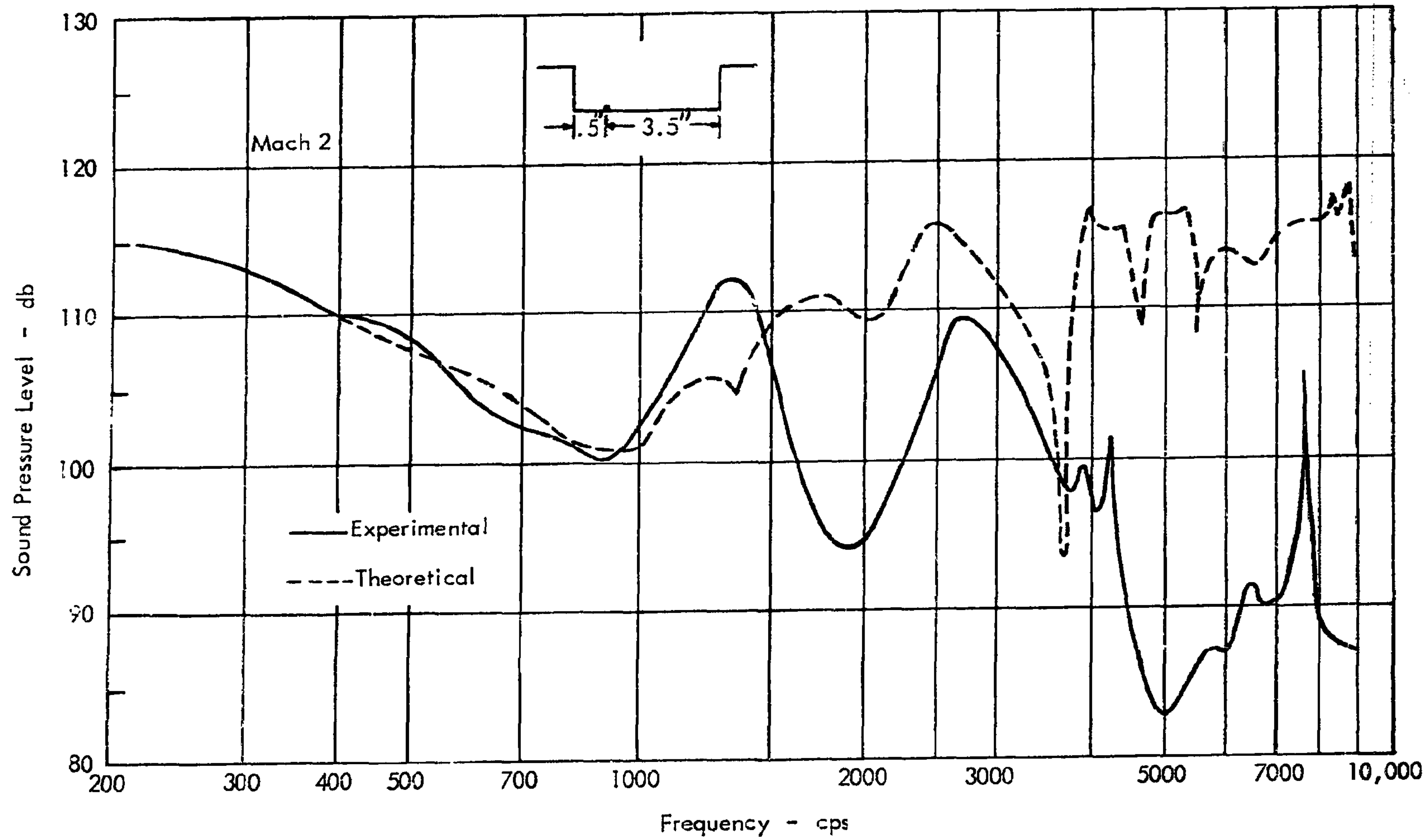


FIGURE 47. COMPARISON OF CALCULATED AND MEASURED RESPONSE SPECTRA OF A 4" LENGTH X 2" WIDTH X 2.5" DEPTH CAVITY.

VII - CONCLUSIONS

The analytical and experimental investigation reported herein indicates the following conclusions:

1. The acoustic response of cavities in either subsonic or supersonic airflow comprises dual phenomena involving

   a. A random frequency buffet response

   b. A discrete-frequency resonant response

2. For short cavities the total response is primarily resonant; for long cavities the buffet and resonant responses are of equal importance.

3. The resonant response can be categorized as almost entirely the depth mode for cavities of length-to-depth ratio of one or less, and predominately the lengthwise modes for cavities wherein length is 2 to 3 times depth.

4. Classical theory, developed herein to account for the effects of a moving medium adjoining the cavity opening, is found to provide excellent definition of the response frequencies and fair definition of the amplitude response for both subsonic and supersonic regimes.

5. On the basis of results presented, it appears that the spectrum of boundary-layer noise may be taken as the forcing function in calculating response.

6. The theory can be simplified in the form of a design approach that will permit fairly rapid assessment of the approximate response of a given cavity, as given in the following section.

VIII. DESIGN SUMMARY

The following is in the nature of a summary intended to enable a designer to assess the frequencies and dynamic pressure loading to be expected on the structural surface of a given cavity.

A. CAVITY LENGTH/DEPTH<1.0

Both the amplification factor and the resonant frequencies are obtained from Eq. (62) below.

$$p_p/p_o = \left[\left[R\ \sin(\gamma L_z/L_x)\right]^2 + \left[X\ \sin(\gamma L_z/L_x) - \cos(\gamma L_z/L_x)\right]^2\right]^{-\frac{1}{2}} \quad (62)$$

where:

- f is frequency in cps.
- L_x is streamwise cavity length
- L_z is cavity depth
- R is the radiation resistance, given in Figure 48 for both subsonic and supersonic cases at width/length ratios for .125 to 2.0.
- X is the radiation reactance, given in Figure 48 for the same Mach numbers and width/length ratios.

B. CAVITY LENGTH/DEPTH >1.0

In these cases the length modes are predominant, and it is necessary to employ the more general theory. Frequencies may be determined from the characteristic frequency equation

$$f_N^2 = \frac{c^2}{4}\left[\left(\frac{n_x}{L_x}\right)^2 + \left(\frac{n_y}{L_y}\right)^2 - \left(\frac{g_n}{L_z}\right)^2\right] \quad (63)$$

where $g_n = \xi_n + i\eta_n$

On the basis of experimental evidence, the transverse modes are not normally excited, thus the resonant frequencies may be reasonably approximated by

$$f_N^2 = \frac{c^2}{4}\left[\left(\frac{n_x}{L_x}\right)^2 - \left(\frac{g_n}{L_z}\right)^2\right] = \frac{c^2}{4}\left[\left(\frac{n_x}{L_x}\right)^2 - \left(\frac{\xi_n}{L_z}\right)^2 + \left(\frac{\eta_n}{L_z}\right)^2 - \frac{2i\xi_n\eta_n}{L_z^2}\right] \quad (64)$$

Because of the frequency dependent nature of g_n, determination of f_n becomes an iterative process, as outlined by the following steps.

(1) It may be helpful in initiating this process to take the first approximation of frequency as that for a closed cavity, that is

$$f_N^2 = \frac{c^2}{4}\left[\left(\frac{n_x}{L_x}\right)^2 + \left(\frac{n_z}{L_z}\right)^2\right] \quad (65)$$

(2) Enter the impedance tables of Appendix B or C and determine values of R and X.

(3) Calculate the constants a and b as follows:

$$a = \frac{2f_N L_z X}{c(R^2 + X^2)} \qquad b = \frac{2f_N L_z R}{c(R^2 + X^2)} \qquad (66)$$

(4) Take the values of a and b calculated in step 3 and using figure 49 read the values of ξ_n and η_n for the desired mode. If the value of b is negative, treat it as positive in determining ξ_n and η_n, but record η_n as a negative number. In other words, η_n always carries the sign of b.

(5) With the values of ξ_n and η_n from step 4 a second approximation of natural frequency, f_N can be calculated as follows (neglecting damping):

$$f_N = \frac{c}{2}\left[\left(\frac{n_x}{L_x}\right)^2 + \left(\frac{\eta_n}{L_z}\right)^2 - \left(\frac{\xi_n}{L_z}\right)^2\right]^{1/2} \qquad (67)$$

(6) Examine f_N in comparison with the first approximation of f. If f_N − f is positive, choose a higher value of f, and if negative, a lower value of f, and go back to step 2. When a change of sign of f_N − f is obtained, these points should be plotted as a curve of f_N − f vs. f. This method will give the approximate intercept on the f-axis. More iterations can be made for higher accuracy.

It should be pointed out that in this process, certain values of a and b in an iterative sequence may cause the values of ξ_n and η_n to cross a dotted mode line in figure 49, thus apparently denoting a change of mode. When this occurs, the apparent mode change may be disregarded and continuity of the iteration maintained.

It is also observed that some modes may have a resonant frequency in the vicinity of the crossover point, where radiation resistance changes from negative to positive. In such cases two distinct resonances may be calculated.

(7) Once correct values of f_n, ξ_n and η_n have been determined the resonant response for the mode in question can be calculated from the following equations.

$$p_N = 20 \log_{10}\left[\frac{p_{p_N}}{p_{ref}}\right]$$

where (68)

$$p_{p_N} = \frac{i8\sigma f_N L_z A(x',y',z')\, g_n \phi_N(x,y,z)\, \phi_N(x',y',z')}{L_x L_y \varepsilon_{n_x}\left[\sinh(2\pi g_n) + 2\pi g_n\right]\xi_n \eta_n}$$

The coordinates (x, y, z) are the location of the point in the cavity where sound pressure is desired and (x', y', z') is the location of the sound source of strength A(x', y', z').

The above calculations should be made for all combinations of n_x and n. It is recommended that n_x range from 0 to 6 and n be 0, 1, and 2.

SAMPLE CALCULATION

DATA:

$n_x = 2,\ n_z = 1,\ n = 0,\ L_x = 8.",\ L_y = 2.",\ L_z = 3.5"$

$c = 13,900.$ IN/SEC, $x = .5",\ x' = 0,\ z = 0,\ z' = 3.5"$

$A(x', z') = 3,\ \sigma = 1.065 \times 10^{-8}$ LB-SEC^2/IN^4

Going through the steps outlined at the beginning of the section, the following results are obtained.

(1) Using Eq. (65), the first approximation to frequency f_N is, $f_{N1} = 2650$ cps.

(2) Using the above frequency of 2650 cps, values of impedance from Appendix C are:

$R = .846 \qquad\qquad X = .564$

(3) Impedance and frequency from steps (1) and (2) yield the constants:

$a = .73 \qquad\qquad b = 1.10$

(4) From Figure 49 the values of ξ_n and η_n for $n = 0$ are:

$\xi_o = .14 \qquad\qquad \eta_o = .56$

(5) The second approximation to natural frequency, using the values of step (4), is

$f_{N2} = 2045$ cps

(6) Compare f_N of step (5) with f_N of step (1).

$f_{N2} - f_{N1} = -605$ cps

The result is negative, therefore choose a lower value of f_N, say $f_{N3} = 2150$ cps, to insert into step (2).

After calculation of steps (2) – (5), a natural frequency, $f_{N4} = 2070$ cps is found. Comparison with f_{N3} gives a value of -80 cps so that smaller value of f_N must be chosen. Choosing $f_{N5} = 2000$ cps yields a value of $f_{N6} = 2070$ cps.

For the final iteration use a value of f_N in step (2) of 2070 cps. This results in a value of $f_N = 2070$ cps in step (5). Therefore the correct value of f_N is 2070 cps. The correct values of ξ_o and η_o are $\xi_o = .16$, $\eta_o = .59$.

(7) Using the input constants and the above values of f_N, ξ_n, η_n, sound pressure level in the cavity may be calculated.

The value of p_{p_N} from Eq. 68 is

$p_{p_N} = 14.35 \times 10^{-5}$ psi

$p_N = 94$ db

In order to compare with the value of SPL from figure 46, a value of 17 db must be added to account for the 50 cps bandwidth used for presenting SPL in figure 46. This gives a value of p_N of 111 db which is approximately the same as found with the more complicated machine calculation.

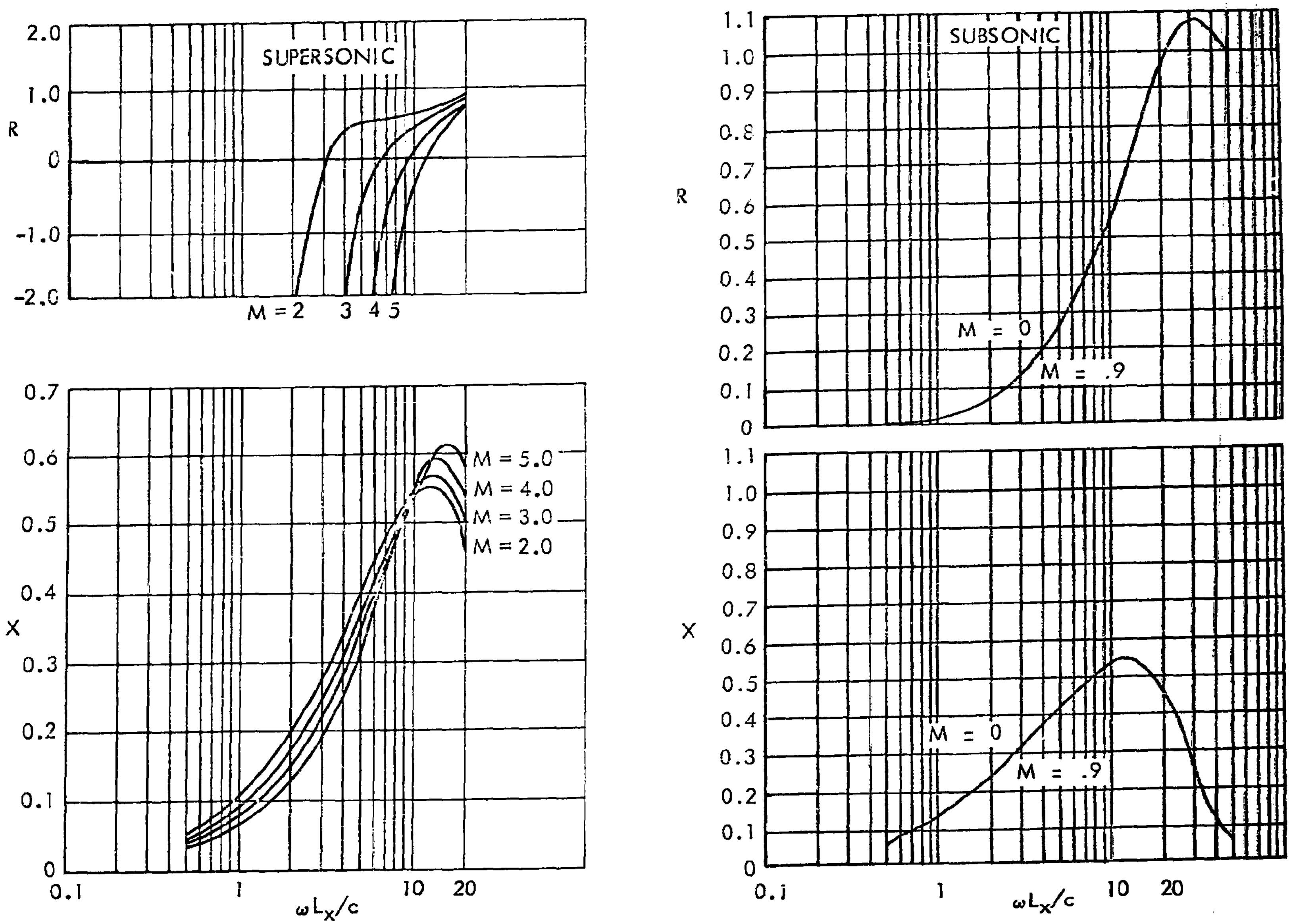


FIGURE 48. RADIATION IMPEDANCE FOR CAVITY OF ASPECT RATIO L_y/L_x = .125

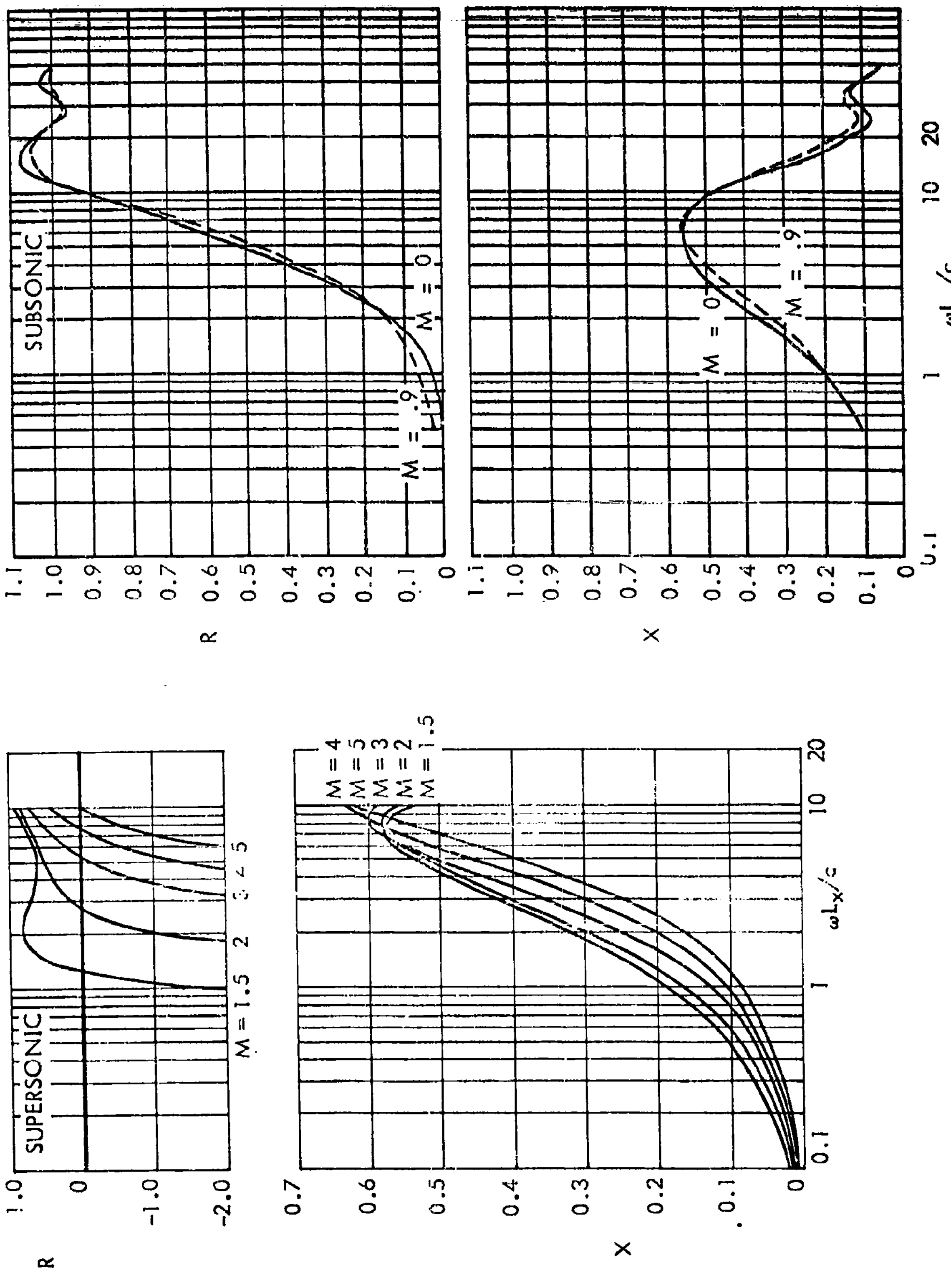


FIGURE 48. (Contd.) L_y/L_x = .25

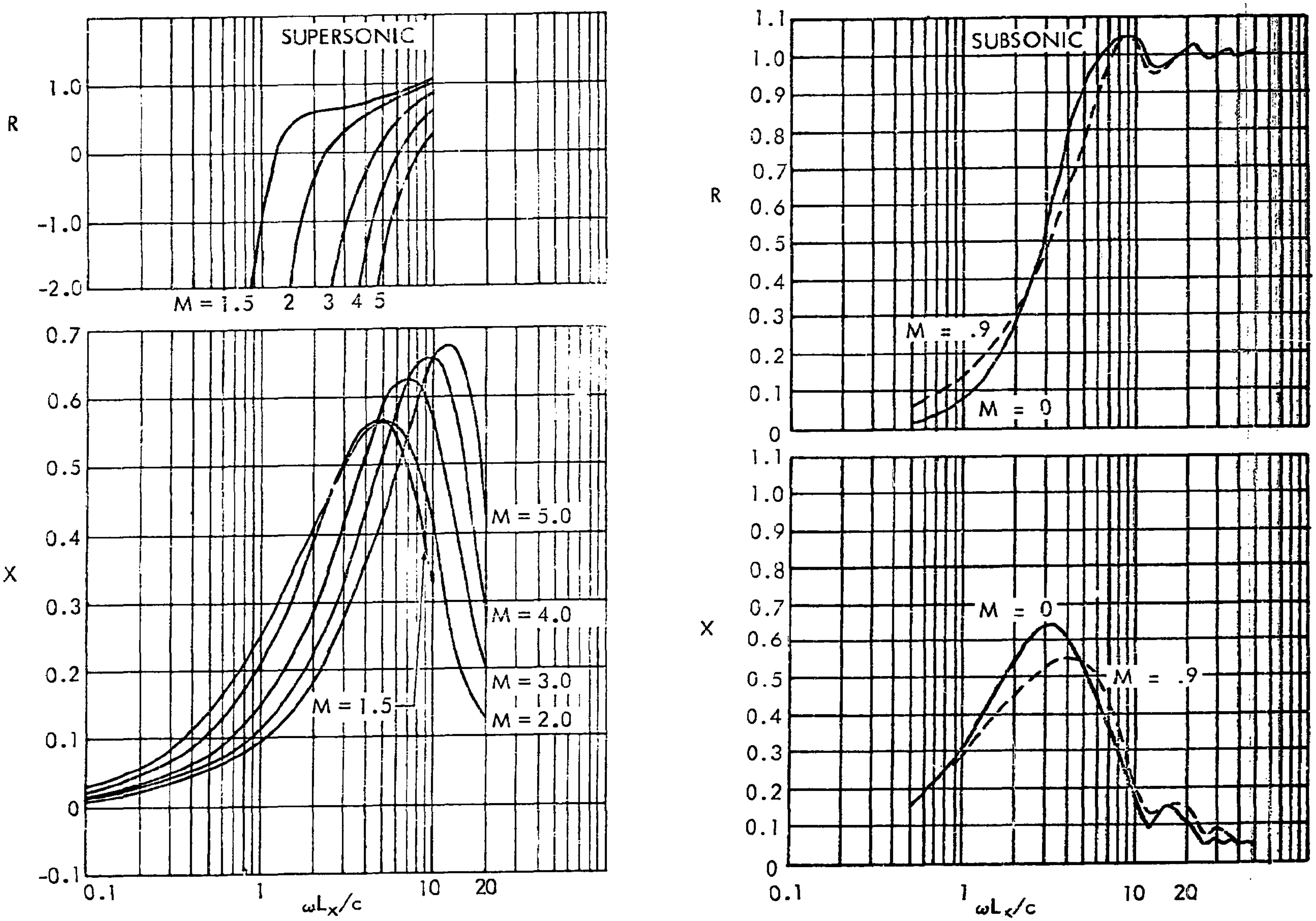


FIGURE 48. (Contd.) $L_y/L_x = 0.5$

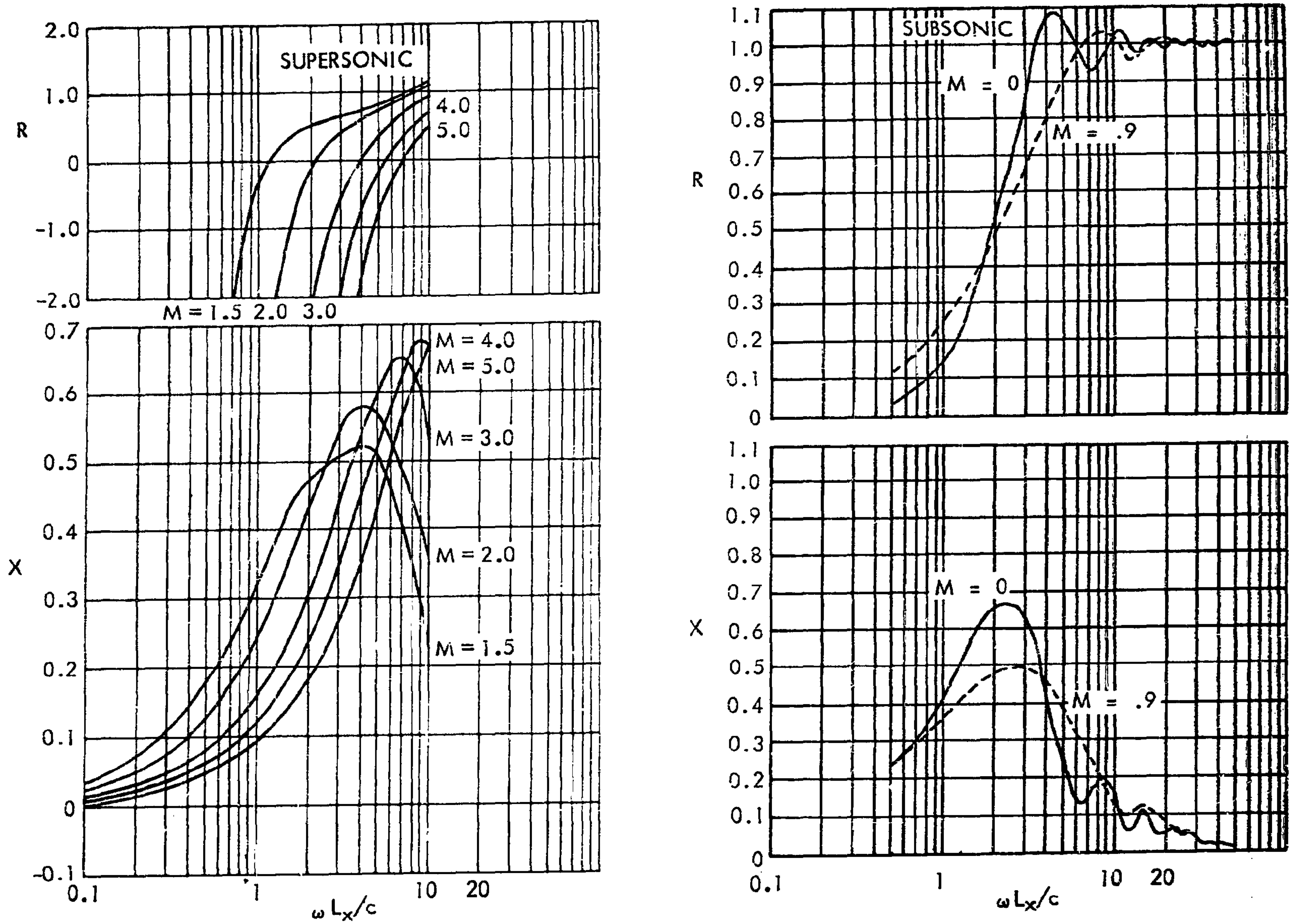


FIGURE 48. (Contd.) $L_y/L_x = 1.0$

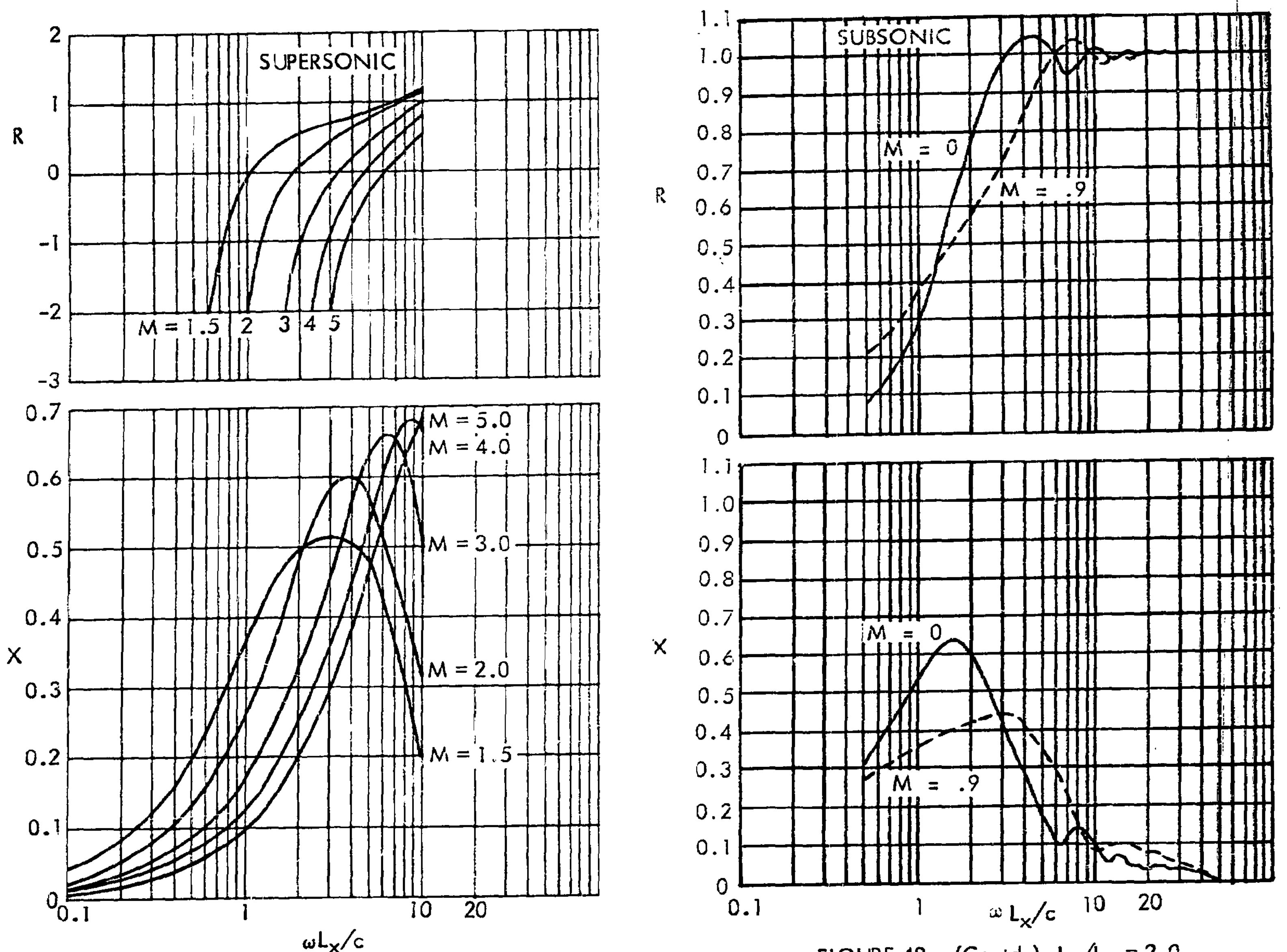


FIGURE 48. (Contd.) $L_y/L_x = 2.0$

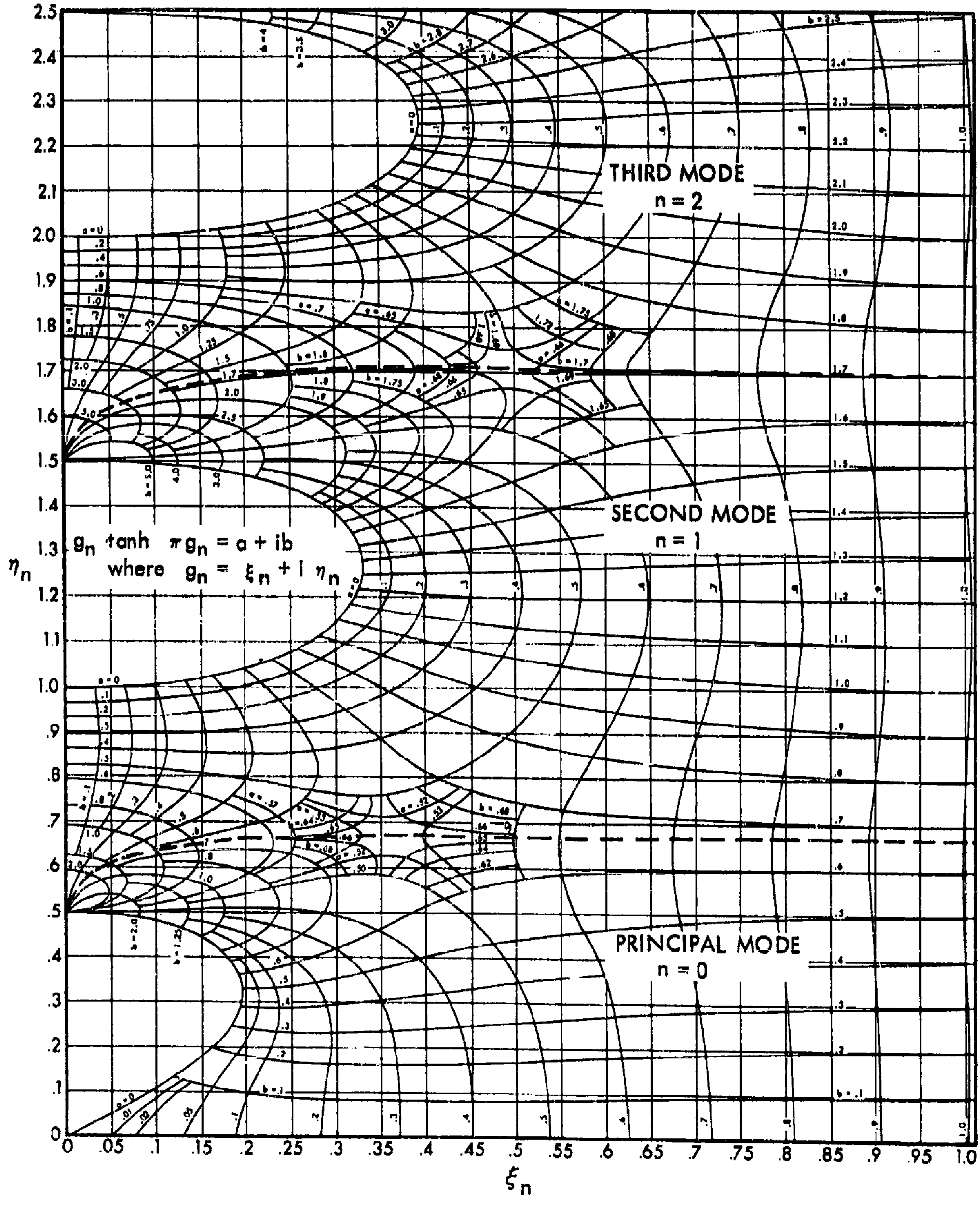


FIGURE 49. SOLUTIONS TO BOUNDARY CONDITION FUNCTION

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APPENDIX A

HELMHOLTZ RESONATORS

The Helmholtz resonator configuration may be regarded analytically as an extension of the simplified short-cavity case. As with the short-cavity case, it is assumed that a weightless air piston vibrates as a rigid body in the mouth of the resonator. The impedance as viewed from the mouth of the resonator is then

$$Z_T = Z_R + Z_H$$

where Z_T is the total impedance and

$$Z_R = R + iX$$

the radiation impedance as given by Eqs. (32) and (33) for a subsonic medium and by Eqs. (46) and (47) for a supersonic medium. Z_H, the impedance of the Helmholtz cavity, comprises the inductive reactance of the air piston in the mouth and the capacitive reactance of the volume of the resonator. It can be written as

$$Z_H = -i\,\omega\left(\frac{\sigma L}{S}\right) + i\left(\frac{\sigma c^2}{V}\right)$$

Combination of this equation with Eq. (47) gives the total reactive impedance of the Helmholtz configuration and yields the resonant frequency when $X_c = X_L$.

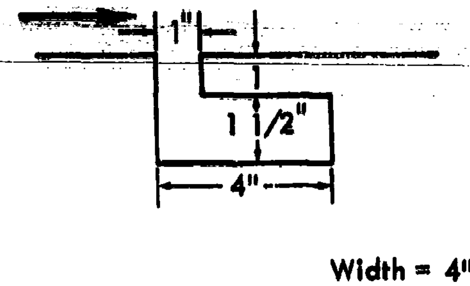
The amplification of a Helmholtz resonator is shown in Reference 9 to be, at resonance,

$$\frac{p}{p_o} = 20 \,\mathrm{Log}_{10}\left(\frac{c}{\omega_n V R}\right)$$

where R is radiation resistance
V is resonator volume
ω_n is resonant frequency

Figure 50 gives a plot of the calculated resonant frequency of the resonator shown in the inset.

Amplification calculations for this resonator indicated that an appreciable attenuation, rather than amplification, should occur. This configuration was tested at all Mach numbers of the AEDC test program, but in no case was the response of sufficient magnitude to be observed over the buffet or microphone self-noise. This result may be construed as evidence of very low response.



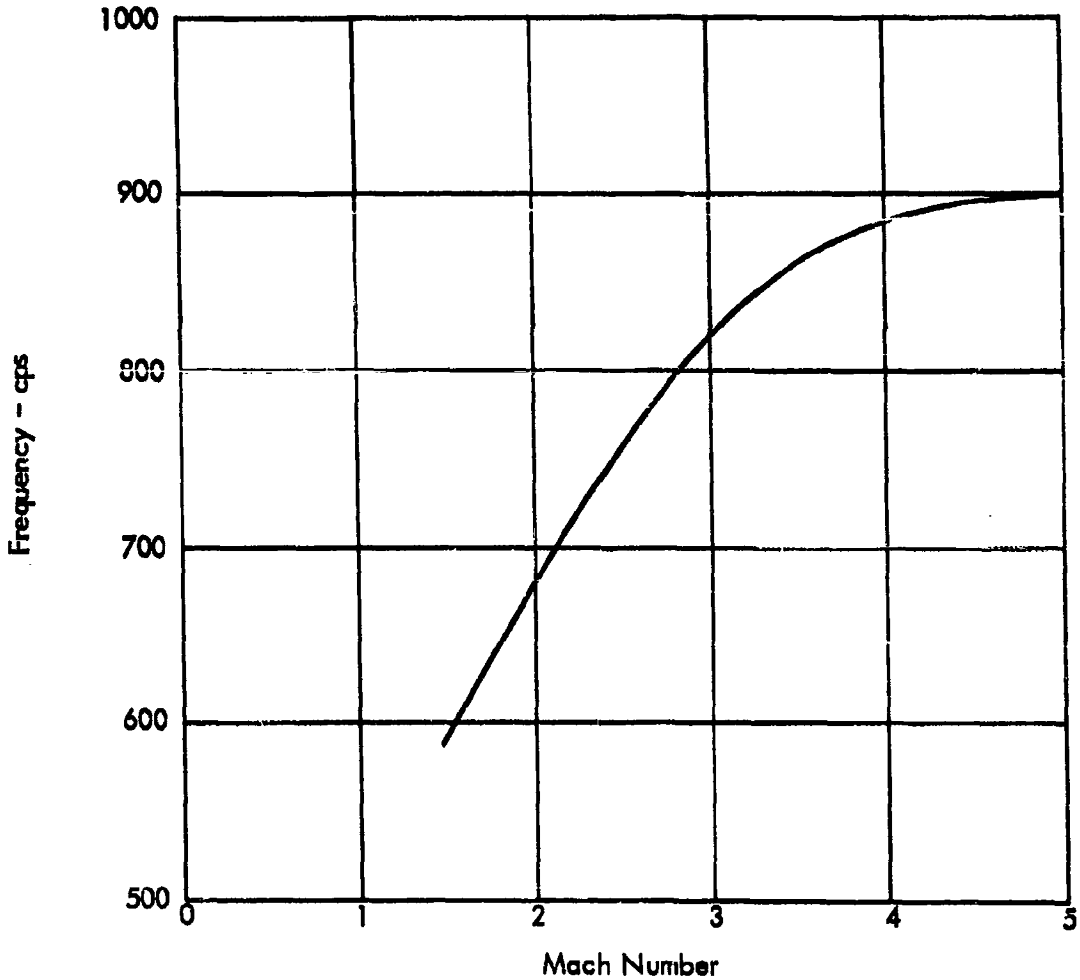


FIGURE 50. CALCULATED FREQUENCY RESPONSE OF TEST RESONATOR

SUBSONIC RADIATION IMPEDANCE

	MACH NUMBER 0.		MACH NUMBER 0.		MACH NUMBER 0.	
	WIDTH TO LENGTH RATIO 0.0625		WIDTH TO LENGTH RATIO 0.1250		WIDTH TO LENGTH RATIO 0.2500	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.50	0.0025	0.0394	0.0049	0.0655	0.0099	0.1050
1.00	0.0097	0.0777	0.0193	0.1285	0.0386	0.2048
1.50	0.0210	0.1136	0.0420	0.1869	0.0838	0.2949
2.00	0.0357	0.1465	0.0713	0.2391	0.1418	0.3718
2.50	0.0526	0.1759	0.1049	0.2841	0.2081	0.4338
3.00	0.0707	0.2016	0.1409	0.3217	0.2782	0.4804
3.50	0.0890	0.2241	0.1772	0.3526	0.3480	0.5127
4.00	0.1068	0.2438	0.2123	0.3776	0.4145	0.5330
4.50	0.1237	0.2613	0.2454	0.3986	0.4755	0.5440
5.00	0.1395	0.2775	0.2761	0.4165	0.5304	0.5487
5.50	0.1543	0.2929	0.3047	0.4327	0.5796	0.5497
6.00	0.1684	0.3080	0.3317	0.4480	0.6241	0.5489
6.50	0.1823	0.3230	0.3579	0.4630	0.6655	0.5473
7.00	0.1962	0.3379	0.3841	0.4777	0.7052	0.5451
7.50	0.2106	0.3525	0.4108	0.4918	0.7443	0.5418
8.00	0.2256	0.3666	0.4384	0.5047	0.7832	0.5365
8.50	0.2411	0.3800	0.4667	0.5160	0.8219	0.5281
9.00	0.2569	0.3924	0.4955	0.5252	0.8597	0.5162
9.50	0.2730	0.4037	0.5243	0.5320	0.8955	0.5003
10.00	0.2889	0.4139	0.5525	0.5365	0.9283	0.4808
10.50	0.3045	0.4231	0.5796	0.5391	0.9572	0.4583
11.00	0.3197	0.4315	0.6054	0.5400	0.9816	0.4341
11.50	0.3343	0.4395	0.6297	0.5399	1.0015	0.4092
12.00	0.3484	0.4471	0.6526	0.5392	1.0173	0.3847
12.50	0.3623	0.4546	0.6746	0.5382	1.0298	0.3613
13.00	0.3760	0.4621	0.6961	0.5370	1.0397	0.3395
13.50	0.3898	0.4694	0.7172	0.5357	1.0480	0.3192
14.00	0.4038	0.4765	0.7382	0.5339	1.0553	0.3001
14.50	0.4181	0.4833	0.7593	0.5315	1.0618	0.2815
15.00	0.4325	0.4895	0.7803	0.5281	1.0676	0.2631
15.50	0.4471	0.4951	0.8011	0.5235	1.0724	0.2444
16.00	0.4616	0.5000	0.8215	0.5176	1.0756	0.2255
16.50	0.4759	0.5042	0.8407	0.5105	1.0768	0.2064
17.00	0.4899	0.5079	0.8570	0.5025	1.0757	0.1877
17.50	0.5035	0.5111	0.8760	0.4937	1.0723	0.1700
18.00	0.5168	0.5141	0.8917	0.4847	1.0667	0.1540
18.50	0.5297	0.5169	0.9064	0.4755	1.0596	0.1400
19.00	0.5424	0.5197	0.9202	0.4664	1.0514	0.1284
19.50	0.5550	0.5223	0.9334	0.4575	1.0429	0.1191
20.00	0.5676	0.5249	0.9462	0.4486	1.0347	0.1118
20.50	0.5803	0.5272	0.9588	0.4397	1.0272	0.1062
21.00	0.5932	0.5293	0.9711	0.4304	1.0205	0.1016
21.50	0.6060	0.5309	0.9832	0.4206	1.0155	0.0977
22.00	0.6189	0.5320	0.9947	0.4102	1.0089	0.0941
22.50	0.6315	0.5327	1.0056	0.3992	1.0035	0.0907
23.00	0.6439	0.5329	1.0156	0.3876	0.9979	0.0875
23.50	0.6560	0.5327	1.0245	0.3758	0.9919	0.0850
24.00	0.6677	0.5324	1.0324	0.3639	0.9856	0.0833
24.50	0.6791	0.5318	1.0393	0.3521	0.9792	0.0828
25.00	0.6903	0.5313	1.0454	0.3406	0.9730	0.0836
25.50	0.7013	0.5307	1.0503	0.3295	0.9674	0.0858
26.00	0.7122	0.5300	1.0557	0.3186	0.9628	0.0891
26.50	0.7231	0.5293	1.0603	0.3084	0.9596	0.0931
27.00	0.7341	0.5284	1.0649	0.2982	0.9578	0.0975
27.50	0.7451	0.5272	1.0690	0.2979	0.9573	0.1017
28.00	0.7561	0.5257	1.0729	0.2775	0.9580	0.1054
28.50	0.7670	0.5237	1.0764	0.2670	0.9593	0.1084
29.00	0.7776	0.5214	1.0793	0.2562	0.9611	0.1107
29.50	0.7880	0.5187	1.0815	0.2454	0.9629	0.1124
30.00	0.7980	0.5159	1.0827	0.2347	0.9646	0.1137
30.50	0.8076	0.5127	1.0835	0.2243	0.9662	0.1150
31.00	0.8167	0.5095	1.0834	0.2143	0.9677	0.1163
31.50	0.8259	0.5064	1.0827	0.2049	0.9695	0.1180
32.00	0.8343	0.5033	1.0817	0.1860	0.9717	0.1198
32.50	0.8435	0.5002	1.0806	0.1876	0.9746	0.1216
33.00	0.8521	0.4971	1.0796	0.1797	0.9782	0.1231
33.50	0.8605	0.4939	1.0783	0.1721	0.9825	0.1241
34.00	0.8694	0.4905	1.0770	0.1646	0.9873	0.1243
34.50	0.8780	0.4870	1.0755	0.1572	0.9923	0.1235
35.00	0.8864	0.4832	1.0736	0.1498	0.9972	0.1216
35.50	0.8947	0.4792	1.0717	0.1426	1.0016	0.1190
36.00	0.9027	0.4749	1.0692	0.1355	1.0054	0.1157
36.50	0.9104	0.4705	1.0662	0.1287	1.0084	0.1120
37.00	0.9181	0.4661	1.0626	0.1223	1.0106	0.1084
37.50	0.9254	0.4615	1.0591	0.1165	1.0124	0.1049
38.00	0.9326	0.4569	1.0552	0.1113	1.0138	0.1016
38.50	0.9396	0.4523	1.0512	0.1066	1.0151	0.0986
39.00	0.9464	0.4476	1.0474	0.1024	1.0164	0.0958
39.50	0.9532	0.4429	1.0436	0.0986	1.0179	0.0928
40.00	0.9599	0.4380	1.0400	0.0950	1.0194	0.0897
40.50	0.9664	0.4329	1.0366	0.0916	1.0208	0.0861
41.00	0.9727	0.4276	1.0331	0.0883	1.0219	0.0821
41.50	0.9788	0.4222	1.0293	0.0851	1.0225	0.0777
42.00	0.9846	0.4167	1.0253	0.0820	1.0223	0.0732
42.50	0.9900	0.4111	1.0216	0.0792	1.0214	0.0688
43.00	0.9952	0.4055	1.0177	0.0766	1.0197	0.0646
43.50	1.0000	0.4000	1.0135	0.0743	1.0175	0.0611
44.00	1.0047	0.3946	1.0092	0.0733	1.0149	0.0582
44.50	1.0092	0.3893	1.0051	0.0723	1.0123	0.0560
45.00	1.0136	0.3842	1.0013	0.0718	1.0097	0.0545
45.50	1.0186	0.3791	0.9977	0.0716	1.0076	0.0533
46.00	1.0224	0.3740	0.9945	0.0715	1.0054	0.0525
46.50	1.0267	0.3688	0.9916	0.0716	1.0037	0.0517
47.00	1.0310	0.3636	0.9890	0.0716	1.0022	0.0508
47.50	1.0352	0.3582	0.9864	0.0716	1.0006	0.0498
48.00	1.0392	0.3527	0.9839	0.0715	0.9988	0.0489
48.50	1.0431	0.3471	0.9813	0.0715	0.9968	0.0480
49.00	1.0467	0.3414	0.9786	0.0716	0.9945	0.0475
49.50	1.0501	0.3357	0.9759	0.0720	0.9920	0.0474
50.00	1.0533	0.3301	0.9731	0.0727	0.9895	0.0478

	MACH NUMBER 0. WIDTH TO LENGTH RATIO 0.5000		MACH NUMBER 0. WIDTH TO LENGTH RATIO 1.0000		MACH NUMBER 0. WIDTH TO LENGTH RATIO 2.0000	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.50	0.0197	0.1606	0.0392	0.2315	0.0769	0.3095
1.00	0.0769	0.3095	0.1506	0.4333	0.2775	0.5347
1.50	0.1657	0.4567	0.3161	0.5813	0.5209	0.6312
2.00	0.2775	0.5347	0.5101	0.6613	0.7540	0.6100
2.50	0.4021	0.5996	0.7043	0.6711	0.9079	0.5209
3.00	0.5289	0.6312	0.8731	0.6200	0.9890	0.4183
3.50	0.6486	0.6327	0.9981	0.5262	1.0236	0.3335
4.00	0.7540	0.6100	1.0710	0.4124	1.0390	0.2694
4.50	0.8409	0.5702	1.0936	0.3013	1.0465	0.2150
5.00	0.9079	0.5209	1.0770	0.2104	1.0422	0.1640
5.50	0.9562	0.4686	1.0363	0.1503	1.0211	0.1225
6.00	0.9890	0.4183	0.9887	0.1232	0.9885	0.1014
6.50	1.0101	0.3730	0.9485	0.1240	0.9591	0.1046
7.00	1.0236	0.3335	0.9252	0.1427	0.9470	0.1233
7.50	1.0326	0.2995	0.9219	0.1676	0.9551	0.1415
8.00	1.0390	0.2694	0.9364	0.1884	0.9748	0.1473
8.50	1.0438	0.2417	0.9622	0.1979	0.9934	0.1397
9.00	1.0465	0.2150	0.9912	0.1932	1.0041	0.1259
9.50	1.0463	0.1890	1.0161	0.1759	1.0080	0.1134
10.00	1.0422	0.1640	1.0315	0.1503	1.0106	0.1040
10.50	1.0337	0.1413	1.0354	0.1223	1.0141	0.0945
11.00	1.0211	0.1225	1.0285	0.0977	1.0161	0.0817
11.50	1.0054	0.1098	1.0144	0.0806	1.0121	0.0676
12.00	0.9885	0.1014	0.9974	0.0727	1.0012	0.0578
12.50	0.9723	0.1002	0.9821	0.0737	0.9881	0.0569
13.00	0.9591	0.1046	0.9720	0.0811	0.9796	0.0640
13.50	0.9504	0.1130	0.9689	0.0915	0.9797	0.0736
14.00	0.9470	0.1233	0.9720	0.1013	0.9867	0.0793
14.50	0.9488	0.1334	0.9817	0.1074	0.9952	0.0787
15.00	0.9551	0.1415	0.9934	0.1082	1.0010	0.0739
15.50	0.9643	0.1463	1.0049	0.1033	1.0034	0.0686
16.00	0.9748	0.1473	1.0135	0.0938	1.0046	0.0648
16.50	0.9849	0.1448	1.0176	0.0817	1.0066	0.0612
17.00	0.9934	0.1397	1.0167	0.0696	1.0087	0.0559
17.50	0.9999	0.1330	1.0114	0.0595	1.0083	0.0487
18.00	1.0041	0.1259	1.0033	0.0534	1.0039	0.0422
18.50	1.0066	0.1192	0.9943	0.0517	0.9968	0.0396
19.00	1.0080	0.1134	0.9872	0.0542	0.9904	0.0420
19.50	1.0092	0.1084	0.9831	0.0596	0.9880	0.0475
20.00	1.0106	0.1040	0.9828	0.0660	0.9903	0.0524
20.50	1.0123	0.0995	0.9864	0.0713	0.9950	0.0540
21.00	1.0141	0.0945	0.9926	0.0741	0.9993	0.0524
21.50	1.0156	0.0885	0.9999	0.0735	1.0016	0.0496
22.00	1.0161	0.0817	1.0064	0.0694	1.0026	0.0471
22.50	1.0150	0.0746	1.0107	0.0627	1.0036	0.0452
23.00	1.0121	0.0676	1.0116	0.0550	1.0051	0.0427
23.50	1.0073	0.0610	1.0097	0.0477	1.0058	0.0387
24.00	1.0012	0.0570	1.0051	0.0425	1.0043	0.0342
24.50	0.9945	0.0561	0.9993	0.0401	1.0004	0.0312
25.00	0.9881	0.0569	0.9937	0.0407	0.9957	0.0312
25.50	0.9829	0.0597	0.9897	0.0437	0.9926	0.0341
26.00	0.9796	0.0640	0.9882	0.0460	0.9925	0.0378
26.50	0.9786	0.0690	0.9896	0.0524	0.9950	0.0403
27.00	0.9797	0.0736	0.9929	0.0554	0.9981	0.0405
27.50	0.9826	0.0772	0.9977	0.0562	1.0005	0.0390
28.00	0.9867	0.0793	1.0026	0.0546	1.0016	0.0372
28.50	0.9911	0.0798	1.0064	0.0509	1.0022	0.0358
29.00	0.9952	0.0787	1.0083	0.0458	1.0030	0.0344
29.50	0.9986	0.0766	1.0079	0.0406	1.0039	0.0323
30.00	1.0010	0.0739	1.0054	0.0362	1.0038	0.0293
30.50	1.0025	0.0711	1.0017	0.0335	1.0020	0.0265
31.00	1.0034	0.0686	0.9975	0.0329	0.9980	0.0252
31.50	1.0040	0.0666	0.9940	0.0343	0.9957	0.0263
32.00	1.0046	0.0648	0.9919	0.0371	0.9944	0.0289
32.50	1.0055	0.0631	0.9917	0.0403	0.9952	0.0315
33.00	1.0066	0.0612	0.9934	0.0432	0.9974	0.0326
33.50	1.0078	0.0589	0.9964	0.0448	0.9996	0.0321
34.00	1.0087	0.0559	1.0000	0.0447	1.0009	0.0308
34.50	1.0070	0.0525	1.0034	0.0429	1.0014	0.0296
35.00	1.0083	0.0487	1.0057	0.0377	1.0019	0.0287
35.50	1.0066	0.0452	1.0064	0.0359	1.0026	0.0276
36.00	1.0039	0.0422	1.0056	0.0321	1.0031	0.0257
36.50	1.0005	0.0403	1.0036	0.0295	1.0025	0.0234
37.00	0.9968	0.0396	0.9997	0.0279	1.0005	0.0216
37.50	0.9932	0.0403	0.9963	0.0282	0.9979	0.0215
38.00	0.9904	0.0420	0.9945	0.0299	0.9960	0.0230
38.50	0.9886	0.0446	0.9935	0.0323	0.9956	0.0252
39.00	0.9880	0.0475	0.9940	0.0349	0.9970	0.0268
39.50	0.9887	0.0502	0.9953	0.0368	0.9989	0.0271
40.00	0.9903	0.0524	0.9985	0.0375	1.0003	0.0264
40.50	0.9926	0.0536	1.0014	0.0369	1.0009	0.0254
41.00	0.9950	0.0540	1.0037	0.0349	1.0012	0.0246
41.50	0.9974	0.0535	1.0050	0.0320	1.0017	0.0239
42.00	0.9993	0.0524	1.0049	0.0290	1.0023	0.0228
42.50	1.0007	0.0510	1.0035	0.0263	1.0024	0.0211
43.00	1.0016	0.0496	1.0013	0.0247	1.0014	0.0194
43.50	1.0021	0.0483	0.9987	0.0242	0.9995	0.0185
44.00	1.0026	0.0471	0.9963	0.0250	0.9975	0.0190
44.50	1.0030	0.0462	0.9951	0.0268	0.9965	0.0207
45.00	1.0036	0.0452	0.9947	0.0289	0.9969	0.0224
45.50	1.0043	0.0441	0.9958	0.0307	0.9983	0.0233
46.00	1.0051	0.0427	0.9976	0.0319	0.9997	0.0231
46.50	1.0056	0.0409	0.9999	0.0320	1.0006	0.0223
47.00	1.0058	0.0387	1.0021	0.0310	1.0009	0.0215
47.50	1.0054	0.0364	1.0036	0.0290	1.0011	0.0210
48.00	1.0043	0.0342	1.0041	0.0266	1.0016	0.0204
48.50	1.0026	0.0324	1.0036	0.0243	1.0020	0.0194
49.00	1.0004	0.0312	1.0021	0.0224	1.0016	0.0179
49.50	0.9980	0.0308	1.0051	0.0215	1.0006	0.0166
50.00	0.9957	0.0312	0.9981	0.0216	0.9989	0.0163

GENERALIZED FREQUENCY	MACH NUMBER 0.10, WIDTH TO LENGTH RATIO 0.0625: RADIATION RESISTANCE	RADIATION REACTANCE	MACH NUMBER 0.10, WIDTH TO LENGTH RATIO 0.1250: RADIATION RESISTANCE	RADIATION REACTANCE	MACH NUMBER 0.10, WIDTH TO LENGTH RATIO 0.2500: RADIATION RESISTANCE	RADIATION REACTANCE
0.50	0.0025	0.0395	0.0053	0.0656	0.0100	0.1051
1.00	0.0098	0.0777	0.0195	0.1286	0.0390	0.2049
1.50	0.0212	0.1136	0.0423	0.1869	0.0844	0.2948
2.00	0.0359	0.1464	0.0716	0.2389	0.1425	0.3714
2.50	0.0527	0.1757	0.1052	0.2836	0.2086	0.4329
3.00	0.0707	0.2013	0.1410	0.3211	0.2783	0.4791
3.50	0.0889	0.2238	0.1769	0.3519	0.3474	0.5113
4.00	0.1065	0.2435	0.2117	0.3772	0.4132	0.5319
4.50	0.1232	0.2612	0.2445	0.3984	0.4737	0.5435
5.00	0.1390	0.2777	0.2752	0.4167	0.5285	0.5492
5.50	0.1539	0.2933	0.3039	0.4334	0.5781	0.5512
6.00	0.1683	0.3066	0.3314	0.4491	0.6235	0.5511
6.50	0.1824	0.3236	0.3582	0.4642	0.6661	0.5496
7.00	0.1967	0.3383	0.3850	0.4787	0.7070	0.5469
7.50	0.2113	0.3527	0.4122	0.4922	0.7469	0.5425
8.00	0.2263	0.3665	0.4396	0.5044	0.7860	0.5356
8.50	0.2417	0.3795	0.4679	0.5149	0.8241	0.5259
9.00	0.2573	0.3916	0.4961	0.5235	0.8605	0.5129
9.50	0.2729	0.4028	0.5240	0.5302	0.8946	0.4967
10.00	0.2884	0.4131	0.5513	0.5350	0.9257	0.4778
10.50	0.3037	0.4227	0.5776	0.5382	0.9535	0.4568
11.00	0.3187	0.4316	0.6034	0.5401	0.9773	0.4345
11.50	0.3334	0.4400	0.6280	0.5410	0.9978	0.4115
12.00	0.3479	0.4480	0.6517	0.5410	1.0152	0.3885
12.50	0.3623	0.4557	0.6747	0.5403	1.0297	0.3657
13.00	0.3765	0.4630	0.6971	0.5389	1.0418	0.3434
13.50	0.3908	0.4700	0.7191	0.5368	1.0517	0.3215
14.00	0.4050	0.4766	0.7405	0.5340	1.0597	0.3001
14.50	0.4191	0.4828	0.7614	0.5304	1.0657	0.2793
15.00	0.4332	0.4885	0.7816	0.5260	1.0699	0.2590
15.50	0.4472	0.4938	0.8013	0.5209	1.0723	0.2395
16.00	0.4611	0.4988	0.8203	0.5151	1.0730	0.2210
16.50	0.4749	0.5034	0.8386	0.5088	1.0722	0.2036
17.00	0.4886	0.5076	0.8562	0.5019	1.0701	0.1873
17.50	0.5023	0.5115	0.8733	0.4945	1.0670	0.1723
18.00	0.5158	0.5150	0.8898	0.4866	1.0631	0.1584
18.50	0.5293	0.5182	0.9056	0.4781	1.0584	0.1456
19.00	0.5427	0.5209	0.9206	0.4691	1.0530	0.1338
19.50	0.5559	0.5233	0.9352	0.4595	1.0469	0.1230
20.00	0.5689	0.5252	0.9488	0.4495	1.0400	0.1134
20.50	0.5817	0.5269	0.9614	0.4391	1.0325	0.1049
21.00	0.5942	0.5283	0.9732	0.4285	1.0244	0.0979
21.50	0.6065	0.5295	0.9841	0.4179	1.0160	0.0925
22.00	0.6186	0.5306	0.9942	0.4073	1.0076	0.0888
22.50	0.6306	0.5315	1.0036	0.3968	0.9997	0.0866
23.00	0.6426	0.5323	1.0126	0.3864	0.9925	0.0859
23.50	0.6546	0.5327	1.0215	0.3760	0.9862	0.0861
24.00	0.6666	[illegible]	1.0297	0.3654	0.9811	0.0871
24.50	0.6785	0.5332	1.0378	0.3546	0.9769	0.0883
25.00	0.6904	0.5327	1.0452	0.3435	0.9735	0.0895
25.50	0.7021	0.5319	1.0520	0.3320	0.9706	0.0907
26.00	0.7136	0.5307	1.0577	0.3204	0.9676	0.0919
26.50	0.7247	0.5292	1.0630	0.3087	0.9652	0.0932
27.00	0.7355	0.5275	1.0672	0.2971	0.9626	0.0949
27.50	0.7460	0.5257	1.0705	0.2857	0.9602	0.0972
28.00	0.7562	0.5239	1.0731	0.2748	0.9582	0.1002
28.50	0.7663	0.5220	1.0753	0.2644	0.9570	0.1038
29.00	0.7762	0.5201	1.0771	0.2545	0.9568	0.1078
29.50	0.7862	0.5181	1.0787	0.2449	0.9578	0.1120
30.00	0.7961	0.5160	1.0802	0.2355	0.9599	0.1159
30.50	0.8060	0.5137	1.0815	0.2261	0.9631	0.1191
31.00	0.8159	0.5111	1.0825	0.2168	0.9670	0.1214
31.50	0.8257	0.5082	1.0832	0.2074	0.9712	0.1227
32.00	0.8352	0.5049	1.0833	0.1980	0.9754	0.1231
32.50	0.8445	0.5014	1.0828	0.1886	0.9793	0.1227
33.00	0.8535	0.4977	1.0817	0.1796	0.9828	0.1219
33.50	0.8622	0.4939	1.0800	0.1709	0.9858	0.1210
34.00	0.8706	0.4900	1.0779	0.1627	0.9887	0.1200
34.50	0.8788	0.4861	1.0754	0.1552	0.9915	0.1192
35.00	0.8868	0.4822	1.0727	0.1481	0.9945	0.1184
35.50	0.8947	0.4782	1.0699	0.1416	0.9977	0.1174
36.00	0.9025	0.4742	1.0671	0.1354	1.0013	0.1162
36.50	0.9103	0.4700	1.0644	0.1295	1.0051	0.1143
37.00	0.9179	0.4657	1.0616	0.1238	1.0089	0.1118
37.50	0.9253	0.4612	1.0587	0.1183	1.0125	0.1086
38.00	0.9325	0.4566	1.0556	0.1129	1.0156	0.1047
38.50	0.9395	0.4518	1.0522	0.1077	1.0180	0.1004
39.00	0.9463	0.4470	1.0486	0.1028	1.0198	0.0959
39.50	0.9528	0.4421	1.0443	0.0983	1.0208	0.0914
40.00	0.9591	0.4371	1.0407	0.0942	1.0212	0.0871
40.50	0.9653	0.4322	1.0366	0.0906	1.0211	0.0831
41.00	0.9713	0.4273	1.0325	0.0874	1.0208	0.0794
41.50	0.9772	0.4224	1.0285	0.0846	1.0202	0.0759
42.00	0.9830	0.4174	1.0246	0.0821	1.0196	0.0726
42.50	0.9887	0.4124	1.0206	0.0799	1.0188	0.0695
43.00	0.9943	0.4072	1.0171	0.0779	1.0178	0.0664
43.50	0.9996	0.4019	1.0134	0.0761	1.0166	0.0634
44.00	1.0050	0.3965	1.0092	0.0745	1.0152	0.0606
44.50	1.0101	0.3910	1.0061	0.0731	1.0135	0.0579
45.00	1.0150	0.3855	1.0025	0.0720	1.0115	0.0555
45.50	1.0197	0.3799	0.9987	0.0711	1.0093	0.0534
46.00	1.0242	0.3742	0.9953	0.0706	1.0070	0.0517
46.50	1.0285	0.3685	0.9917	0.0703	1.0047	0.0503
47.00	1.0325	0.3626	0.9886	0.0703	1.0023	0.0492
47.50	1.0364	0.3571	0.9853	0.0705	0.9999	0.0484
48.00	1.0401	0.3514	0.9822	0.0709	0.9976	0.0479
48.50	1.0436	0.3457	0.9797	0.0715	0.9953	0.0477
49.00	1.0470	0.3400	0.9771	0.0723	0.9931	0.0479
49.50	1.0501	0.3344	0.9746	0.0733	0.9909	0.0483
50.00	1.0530	0.3283	0.9724	0.0744	0.9890	0.0491

	MACH NUMBER 0.10 WIDTH TO LENGTH RATIO 0.5000		MACH NUMBER 0.10 WIDTH TO LENGTH RATIO 1.0000		MACH NUMBER 0.10 WIDTH TO LENGTH RATIO 2.0000	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.50	0.0199	0.1609	0.0396	0.2319	0.0776	0.3102
1.00	0.0775	0.3078	0.1518	0.4336	0.2796	0.5346
1.50	0.1668	0.4365	0.3181	0.5806	0.5314	0.6288
2.00	0.2788	0.5337	0.5121	0.6589	0.7548	0.6053
2.50	0.4030	0.5976	0.7049	0.6669	0.9055	0.5155
3.00	0.5288	0.6285	0.8712	0.6150	0.9835	0.4145
3.50	0.6470	0.6299	0.9935	0.5219	1.0165	0.3327
4.00	0.7510	0.6079	1.0638	0.4107	1.0320	0.2719
4.50	0.8368	0.5696	1.0858	0.3033	1.0409	0.2201
5.00	0.9037	0.5223	1.0704	0.2164	1.0388	0.1711
5.50	0.9531	0.4720	1.0335	0.1592	1.0208	0.1308
6.00	0.9878	0.4229	0.9904	0.1326	0.9920	0.1095
6.50	1.0114	0.3777	0.9548	0.1316	0.9665	0.1105
7.00	1.0271	0.3370	0.9346	0.1461	0.9567	0.1247
7.50	1.0376	0.3007	0.9318	0.1658	0.9644	0.1375
8.00	1.0441	0.2677	0.9439	0.1816	0.9806	0.1389
8.50	1.0474	0.2372	0.9651	0.1880	0.9940	0.1294
9.00	1.0473	0.2089	0.9886	0.1830	0.9994	0.1168
9.50	1.0436	0.1028	1.0085	0.1682	0.9996	0.1077
10.00	1.0364	0.1596	1.0206	0.1473	1.0005	0.1028
10.50	1.0260	0.1402	1.0244	0.1251	1.0043	0.0980
11.00	1.0134	0.1252	1.0202	0.1055	1.0086	0.0896
11.50	0.9996	0.1151	1.0107	0.0915	1.0088	0.0785
12.00	0.9862	0.1099	0.9994	0.0840	1.0035	0.0694
12.50	0.9744	0.1090	0.9892	0.0826	0.9959	0.0661
13.00	0.9652	0.1114	0.9824	0.0855	0.9911	0.0682
13.50	0.9590	0.1160	0.9799	0.0904	0.9917	0.0715
14.00	0.9560	0.1217	0.9816	0.0950	0.9958	0.0715
14.50	0.9559	0.1275	0.9865	0.0976	0.9992	0.0676
15.00	0.9584	0.1326	0.9929	0.0973	0.9991	0.0624
15.50	0.9628	0.1370	0.9991	0.0940	0.9964	0.0595
16.00	0.9687	0.1399	1.0039	0.0884	0.9941	0.0600
16.50	0.9758	0.1413	1.0065	0.0815	0.9949	0.0619
17.00	0.9837	0.1411	1.0067	0.0747	0.9984	0.0622
17.50	0.9919	0.1390	1.0049	0.0688	1.0021	0.0593
18.00	1.0000	0.1351	1.0019	0.0647	1.0035	0.0546
18.50	1.0075	0.1293	0.9987	0.0623	1.0024	0.0507
19.00	1.0138	0.1217	0.9959	0.0616	1.0007	0.0489
19.50	1.0183	0.1129	0.9941	0.0619	1.0002	0.0485
20.00	1.0207	0.1035	0.9936	0.0627	1.0012	0.0474
20.50	1.0208	0.0941	0.9941	0.0633	1.0020	0.0446
21.00	1.0188	0.0855	0.9954	0.0633	1.0008	0.0410
21.50	1.0153	0.0784	0.9970	0.0627	0.9975	0.0390
22.00	1.0108	0.0731	0.9987	0.0614	0.9939	0.0398
22.50	1.0061	0.0695	1.0000	0.0595	0.9925	0.0429
23.00	1.0016	0.0676	1.0007	0.0573	0.9942	0.0460
23.50	0.9983	0.0667	1.0013	0.0550	0.9978	0.0468
24.00	0.9956	0.0664	1.0013	0.0528	1.0012	0.0451
24.50	0.9937	0.0663	1.0008	0.0508	1.0028	0.0421
25.00	0.9922	0.0660	1.0001	0.0492	1.0029	0.0395
25.50	0.9908	0.0657	0.9992	0.0480	1.0027	0.0379
26.00	0.9892	0.0654	0.9984	0.0473	1.0030	0.0363
26.50	0.9876	0.0656	0.9978	0.0468	1.0032	0.0341
27.00	0.9857	0.0666	0.9974	0.0467	1.0023	0.0312
27.50	0.9843	0.0683	0.9974	0.0466	0.9996	0.0291
28.00	0.9838	0.0709	0.9975	0.0465	0.9961	0.0291
28.50	0.9846	0.0739	0.9984	0.0462	0.9936	0.0314
29.00	0.9868	0.0768	0.9992	0.0455	0.9936	0.0346
29.50	0.9904	0.0790	0.9999	0.0446	0.9959	0.0369
30.00	0.9951	0.0798	1.0004	0.0434	0.9990	0.0370
30.50	1.0003	0.0790	1.0006	0.0421	1.0014	0.0354
31.00	1.0052	0.0765	1.0005	0.0408	1.0024	0.0332
31.50	1.0092	0.0724	1.0002	0.0396	1.0025	0.0315
32.00	1.0118	0.0674	0.9996	0.0386	1.0027	0.0302
32.50	1.0128	0.0620	0.9991	0.0382	1.0029	0.0287
33.00	1.0122	0.0566	0.9987	0.0380	1.0026	0.0266
33.50	1.0105	0.0524	0.9985	0.0379	1.0012	0.0246
34.00	1.0079	0.0492	0.9985	0.0378	0.9987	0.0237
34.50	1.0051	0.0470	0.9989	0.0377	0.9963	0.0246
35.00	1.0025	0.0459	0.9994	0.0373	0.9952	0.0268
35.50	1.0003	0.0455	0.9995	0.0367	0.9960	0.0290
36.00	0.9986	0.0454	1.0002	0.0359	0.9981	0.0299
36.50	0.9974	0.0455	1.0005	0.0349	1.0001	0.0293
37.00	0.9965	0.0454	1.0001	0.0340	1.0011	0.0279
37.50	0.9956	0.0453	0.9993	0.0333	1.0013	0.0266
38.00	0.9947	0.0453	0.9993	0.0328	1.0012	0.0258
38.50	0.9937	0.0454	0.9989	0.0327	1.0014	0.0252
39.00	0.9926	0.0459	0.9987	0.0327	1.0017	0.0242
39.50	0.9918	0.0468	[illegible]	0.0328	1.0016	0.0228
40.00	0.9913	0.0481	0.9992	0.0328	1.0005	0.0215
40.50	0.9915	0.0496	0.9997	0.0326	0.9989	0.0212
41.00	0.9922	0.0511	1.0003	0.0320	0.9977	0.0220
41.50	0.9937	0.0524	1.0003	0.0311	0.9975	0.0233
42.00	0.9956	0.0531	1.0004	0.0301	0.9984	0.0241
42.50	0.9979	0.0533	1.0006	0.0291	0.9996	0.0240
43.00	1.0002	0.0527	1.0006	0.0283	1.0003	0.0231
43.50	1.0024	0.0515	0.9992	0.0278	1.0002	0.0222
44.00	1.0042	0.0498	0.9985	0.0279	0.9998	0.0219
44.50	1.0055	0.0477	0.9980	0.0283	0.9997	0.0221
45.00	1.0064	0.0454	0.9979	0.0289	1.0002	0.0222
45.50	1.0067	0.0430	0.9983	0.0294	1.0000	0.0216
46.00	1.0066	0.0407	0.9992	0.0297	1.0011	0.0206
46.50	1.0060	0.0385	1.0002	0.0295	1.0006	0.0197
47.00	1.0051	0.0366	1.0012	0.0287	0.9998	0.0194
47.50	1.0038	0.0350	1.0017	0.0275	0.9994	0.0196
48.00	1.0023	0.0337	1.0020	0.0261	0.9995	0.0200
48.50	1.0006	0.0328	1.0015	0.0247	0.9999	0.0198
49.00	0.9989	0.0324	1.0005	0.0237	1.0001	0.0192
49.50	0.9971	0.0326	0.9993	0.0233	0.9997	0.0185
50.00	0.9956	0.0330	0.9991	0.0236	0.9989	0.0184

	MACH NUMBER 0.20 WIDTH TO LENGTH RATIO 0.0625		MACH NUMBER 0.20 WIDTH TO LENGTH RATIO 0.1250		MACH NUMBER 0.20 WIDTH TO LENGTH RATIO 0.2500	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.50	0.0026	0.0396	0.0051	0.0648	0.0103	0.1066
1.00	0.0100	0.0779	0.0200	0.1289	0.0400	0.2055
1.50	0.0216	0.1136	0.0432	0.1869	0.0862	0.2947
2.00	0.0364	0.1461	0.0727	0.2383	0.1446	0.3701
2.50	0.0531	0.1750	0.1060	0.2823	0.2101	0.4301
3.00	0.0708	0.2004	0.1410	0.3193	0.2783	0.4753
3.50	0.0884	0.2220	0.1760	0.3500	0.3455	0.5074
4.00	0.1056	0.2428	0.2090	0.3758	0.4092	0.5290
4.50	0.1220	0.2611	0.2420	0.3981	0.4684	0.5428
5.00	0.1377	0.2782	0.2726	0.4177	0.5232	0.5512
5.50	0.1530	0.2944	0.3021	0.4356	0.5743	0.5556
6.00	0.1680	0.3101	0.3309	0.4521	0.6225	0.5569
6.50	0.1830	0.3250	0.3594	0.4671	0.6683	0.5552
7.00	0.1980	0.3394	0.3876	0.4806	0.7119	0.5506
7.50	0.2130	0.3529	0.4156	0.4926	0.7533	0.5430
8.00	0.2280	0.3658	0.4431	0.5030	0.7921	0.5325
8.50	0.2429	0.3780	0.4702	0.5119	0.8280	0.5197
9.00	0.2576	0.3897	0.4967	0.5197	0.8610	0.5051
9.50	0.2723	0.4010	0.5227	0.5264	0.8912	0.4893
10.00	0.2870	0.4118	0.5484	0.5323	0.9191	0.4726
10.50	0.3018	0.4221	0.5740	0.5371	0.9451	0.4552
11.00	0.3169	0.4320	0.5996	0.5409	0.9694	0.4367
11.50	0.3321	0.4412	0.6252	0.5433	0.9920	0.4168
12.00	0.3474	0.4497	0.6505	0.5442	1.0126	0.3954
12.50	0.3626	0.4573	0.6753	0.5434	1.0306	0.3723
13.00	0.3776	0.4642	0.6992	0.5412	1.0455	0.3481
13.50	0.3922	0.4705	0.7213	0.5376	1.0568	0.3234
14.00	0.4064	0.4763	0.7432	0.5333	1.0645	0.2989
14.50	0.4202	0.4818	0.7633	0.5284	1.0689	0.2757
15.00	0.4337	0.4872	0.7824	0.5234	1.0707	0.2544
15.50	0.4471	0.4926	0.8007	0.5183	1.0705	0.2352
16.00	0.4605	0.4978	0.8187	0.5131	1.0694	0.2180
16.50	0.4740	0.5028	0.8365	0.5077	1.0677	0.2025
17.00	0.4877	0.5075	0.8542	0.5017	1.0658	0.1881
17.50	0.5015	0.5117	0.8716	0.4950	1.0636	0.1744
18.00	0.5154	0.5154	0.8887	0.4874	1.0609	0.1612
18.50	0.5291	0.5185	0.9050	0.4790	1.0573	0.1483
19.00	0.5426	0.5212	0.9206	0.4697	1.0527	0.1361
19.50	0.5559	0.5234	0.9351	0.4599	1.0468	0.1249
20.00	0.5688	0.5253	0.9486	0.4497	1.0400	0.1149
20.50	0.5816	0.5270	0.9612	0.4393	1.0324	0.1064
21.00	0.5941	0.5285	0.9730	0.4288	1.0245	0.0996
21.50	0.6066	0.5298	0.9841	0.4133	1.0166	0.0943
22.00	0.6189	0.5309	0.9945	0.4076	1.0088	0.0903
22.50	0.6311	0.5316	1.0043	0.3968	1.0015	0.0874
23.00	0.6432	0.5321	1.0135	0.3859	0.9944	0.0856
23.50	0.6552	0.5324	1.0220	0.3749	0.9877	0.0847
24.00	0.6669	0.5323	1.0293	0.3639	0.9814	0.0848
24.50	0.6785	0.5321	1.0369	0.3529	0.9757	0.0858
25.00	0.6899	0.5317	1.0435	0.3421	0.9706	0.0878
25.50	0.7012	0.5312	1.0496	0.3313	0.9668	0.0904
26.00	0.7124	0.5304	1.0553	0.3207	0.9639	0.0935
26.50	0.7235	0.5295	1.0607	0.3100	0.9621	0.0967
27.00	0.7346	0.5282	1.0656	0.2991	0.9612	0.0997
27.50	0.7456	0.5267	1.0701	0.2881	0.9610	0.1023
28.00	0.7563	0.5248	1.0739	0.2770	0.9612	0.1045
28.50	0.7668	0.5227	1.0768	0.2658	0.9615	0.1063
29.00	0.7770	0.5204	1.0790	0.2548	0.9618	0.1080
29.50	0.7870	0.5179	1.0804	0.2440	0.9621	0.1099
30.00	0.7967	0.5154	1.0811	0.2338	0.9626	0.1121
30.50	0.8062	0.5128	1.0814	0.2240	0.9635	0.1147
31.00	0.8157	0.5102	1.0813	0.2148	0.9652	0.1175
31.50	0.8250	0.5074	1.0811	0.2060	0.9678	0.1202
32.00	0.8344	0.5045	1.0803	0.1975	0.9713	0.1226
32.50	0.8437	0.5014	1.0804	0.1892	0.9755	0.1242
33.00	0.8528	0.4981	1.0797	0.1810	0.9801	0.1250
33.50	0.8618	0.4944	1.0783	0.1728	0.9848	0.1248
34.00	0.8706	0.4906	1.0774	0.1648	0.9894	0.1237
34.50	0.8790	0.4865	1.0756	0.1569	0.9937	0.1221
35.00	0.8872	0.4824	1.0734	0.1494	0.9975	0.1199
35.50	0.8951	0.4781	1.0708	0.1422	1.0009	0.1175
36.00	0.9029	0.4738	1.0680	0.1355	1.0041	0.1150
36.50	0.9104	0.4695	1.0650	0.1292	1.0070	0.1122
37.00	0.9177	0.4651	1.0618	0.1233	1.0096	0.1093
37.50	0.9250	0.4606	1.0585	0.1177	1.0121	0.1061
38.00	0.9320	0.4561	1.0550	0.1124	1.0143	0.1027
38.50	0.9389	0.4515	1.0514	0.1074	1.0160	0.0991
39.00	0.9456	0.4468	1.0477	0.1028	1.0174	0.0954
39.50	0.9523	0.4421	1.0438	0.0985	1.0184	0.0918
40.00	0.9585	0.4374	1.0398	0.0947	1.0191	0.0883
40.50	0.9648	0.4326	1.0358	0.0913	1.0197	0.0849
41.00	0.9710	0.4278	1.0319	0.0883	1.0201	0.0815
41.50	0.9771	0.4228	1.0281	0.0856	1.0204	0.0781
42.00	0.9831	0.4178	1.0245	0.0831	1.0205	0.0745
42.50	0.9890	0.4125	1.0209	0.0808	1.0203	0.0707
43.00	0.9947	0.4071	1.0174	0.0786	1.0197	0.0668
43.50	1.0001	0.4016	1.0137	0.0765	1.0184	0.0629
44.00	1.0052	0.3960	1.0100	0.0747	1.0164	0.0593
44.50	1.0101	0.3903	1.0062	0.0732	1.0139	0.0562
45.00	1.0147	0.3847	1.0023	0.0720	1.0111	0.0537
45.50	1.0191	0.3792	0.9985	0.0713	1.0080	0.0520
46.00	1.0233	0.3737	0.9948	0.0709	1.0051	0.0509
46.50	1.0274	0.3683	0.9914	0.0709	1.0025	0.0504
47.00	1.0315	0.3629	0.9882	0.0711	1.0003	0.0502
47.50	1.0355	0.3575	0.9854	0.0715	0.9984	0.0501
48.00	1.0394	0.3520	0.9827	0.0719	0.9968	0.0500
48.50	1.0431	0.3465	0.9802	0.0724	0.9953	0.0499
49.00	1.0467	0.3408	0.9775	0.0729	0.9938	0.0498
49.50	1.0501	0.3351	0.9754	0.0735	0.9922	0.0497
50.00	1.0532	0.3294	0.9731	0.0742	0.9905	0.0499

GENERALIZED FREQUENCY	MACH NUMBER 0.20 WIDTH TO LENGTH RATIO 0.5000 RADIATION RESISTANCE	RADIATION REACTANCE	MACH NUMBER 0.20 WIDTH TO LENGTH RATIO 1.0000 RADIATION RESISTANCE	RADIATION REACTANCE	MACH NUMBER 0.20 WIDTH TO LENGTH RATIO 2.0000 RADIATION RESISTANCE	RADIATION REACTANCE
0.50	0.0205	0.1617	0.0406	0.2334	0.0799	0.3122
1.00	0.0796	0.3107	0.1557	0.4346	0.2861	0.5341
1.50	0.1703	0.4360	0.3243	0.5702	0.5307	0.6215
2.00	0.2827	0.5306	0.5178	0.6512	0.7567	0.5911
2.50	0.4055	0.5916	0.7062	0.6542	0.8975	0.4997
3.00	0.5280	0.6205	0.8646	0.6003	0.9664	0.4040
3.50	0.6419	0.6219	0.9782	0.5103	0.9952	0.3317
4.00	0.7417	0.6024	1.0424	0.4072	1.0121	0.2805
4.50	0.8252	0.5689	1.0633	0.3111	1.0261	0.2361
5.00	0.8925	0.5272	1.0533	0.2350	1.0312	0.1919
5.50	0.9453	0.4818	1.0271	0.1845	1.0222	0.1537
6.00	0.9857	0.4354	0.9974	0.1581	1.0038	0.1305
6.50	1.0159	0.3893	0.9734	0.1497	0.9876	0.1237
7.00	1.0370	0.3444	0.9594	0.1520	0.9820	0.1253
7.50	1.0498	0.3015	0.9555	0.1580	0.9860	0.1244
8.00	1.0549	0.2615	0.9596	0.1629	0.9913	0.1167
8.50	1.0532	0.2257	0.9684	0.1642	0.9912	0.1057
9.00	1.0460	0.1953	0.9790	0.1613	0.9852	0.0988
9.50	1.0351	0.1711	0.9892	0.1547	0.9792	0.0995
10.00	1.0225	0.1534	0.9976	0.1454	0.9793	0.1049
10.50	1.0103	0.1414	1.0036	0.1347	0.9867	0.1090
11.00	0.9997	0.1337	1.0071	0.1234	0.9977	0.1069
11.50	0.9915	0.1289	1.0079	0.1124	1.0068	0.0988
12.00	0.9853	0.1255	1.0064	0.1027	1.0110	0.0880
12.50	0.9804	0.1226	1.0032	0.0947	1.0110	0.0784
13.00	0.9761	0.1200	0.9989	0.0891	1.0094	0.0711
13.50	0.9716	0.1182	0.9947	0.0860	1.0076	0.0651
14.00	0.9669	0.1179	0.9914	0.0849	1.0051	0.0591
14.50	0.9628	0.1196	0.9896	0.0853	1.0005	0.0538
15.00	0.9600	0.1235	0.9898	0.0861	0.9959	0.0513
15.50	0.9598	0.1290	0.9916	0.0864	0.9875	0.0532
16.00	0.9626	0.1350	0.9945	0.0856	0.9844	0.0587
16.50	0.9688	0.1402	0.9977	0.0833	0.9865	0.0646
17.00	0.9776	0.1432	1.0002	0.0796	0.9926	0.0675
17.50	0.9880	0.1431	1.0016	0.0752	0.9992	0.0658
18.00	0.9985	0.1396	1.0015	0.0708	1.0034	0.0610
18.50	1.0078	0.1331	1.0003	0.0672	1.0045	0.0558
19.00	1.0150	0.1244	0.9984	0.0648	1.0038	0.0521
19.50	1.0195	0.1146	0.9966	0.0630	1.0032	0.0499
20.00	1.0216	0.1046	0.9957	0.0638	1.0034	0.0478
20.50	1.0215	0.0953	0.9966	0.0642	1.0034	0.0450
21.00	1.0198	0.0869	[illegible]	0.0642	1.0022	0.0419
21.50	1.0170	0.0798	0.9997	0.0631	0.9998	0.0399
22.00	1.0134	0.0737	1.0018	0.0607	0.9973	0.0397
22.50	1.0091	0.0688	1.0030	0.0573	0.9961	0.0408
23.00	1.0044	0.0651	1.0024	0.0555	0.9966	0.0417
23.50	0.9994	0.0627	1.0012	0.0501	0.9976	0.0413
24.00	0.9944	0.0618	0.9985	0.0480	0.9979	0.0400
24.50	0.9898	0.0624	0.9951	0.0476	0.9970	0.0391
25.00	0.9863	0.0643	0.9933	0.0488	0.9959	0.0395
25.50	0.9843	0.0676	0.9925	0.0510	0.9961	0.0411
26.00	0.9834	0.0701	0.9955	0.0533	0.9982	0.0424
26.50	0.9842	0.0726	0.9960	0.0547	1.0014	0.0420
27.00	0.9866	0.0747	0.9995	0.0547	1.0042	0.0394
27.50	0.9884	0.0756	1.0027	0.0528	1.0051	0.0357
28.00	0.9908	0.0754	1.0055	0.0494	1.0042	0.0324
28.50	0.9927	0.0747	1.0064	0.0451	1.0024	0.0304
29.00	0.9942	0.0737	1.0055	0.0409	1.0007	0.0295
29.50	0.9953	0.0728	1.0031	0.0376	0.9993	0.0291
30.00	0.9964	0.0722	0.9999	0.0359	0.9981	0.0287
30.50	0.9977	0.0719	0.9966	0.0359	0.9967	0.0288
31.00	0.9996	0.0715	0.9941	0.0373	0.9953	0.0298
31.50	1.0021	0.0707	0.9929	0.0395	0.9949	0.0318
32.00	1.0049	0.0690	0.9933	0.0419	0.9961	0.0337
32.50	1.0076	0.0664	0.9947	0.0436	0.9986	0.0345
33.00	1.0096	0.0629	0.9974	0.0445	1.0013	0.0335
33.50	1.0106	0.0586	1.0001	0.0440	1.0028	0.0312
34.00	1.0107	0.0542	1.0025	0.0424	1.0028	0.0287
34.50	1.0094	0.0501	1.0039	0.0399	1.0019	0.0272
35.00	1.0073	0.0467	1.0044	0.0372	1.0010	0.0266
35.50	1.0045	0.0442	1.0040	0.0346	1.0006	0.0264
36.00	1.0015	0.0426	1.0027	0.0324	1.0007	0.0259
36.50	0.9986	0.0420	1.0016	0.0311	1.0005	0.0250
37.00	0.9960	0.0421	0.9992	0.0305	0.9998	0.0242
37.50	0.9937	0.0427	0.9975	0.0307	0.9988	0.0240
38.00	0.9919	0.0437	0.9963	0.0314	0.9980	0.0244
38.50	0.9905	0.0451	0.9956	0.0326	0.9980	0.0251
39.00	0.9897	0.0469	0.9957	0.0338	0.9985	0.0253
39.50	0.9894	0.0488	0.9964	0.0350	0.9989	0.0251
40.00	0.9899	0.0508	0.9970	0.0357	0.9989	0.0248
40.50	0.9911	0.0527	0.9994	0.0357	0.9987	0.0249
41.00	0.9931	0.0541	1.0012	0.0350	0.9989	0.0254
41.50	0.9955	0.0548	1.0026	0.0336	0.9999	0.0258
42.00	0.9983	0.0547	1.0035	0.0316	1.0014	0.0254
42.50	1.0009	0.0536	1.0035	0.0294	1.0027	0.0240
43.00	1.0030	0.0518	1.0027	0.0274	1.0030	0.0219
43.50	1.0045	0.0495	1.0012	0.0260	1.0021	0.0201
44.00	1.0052	0.0471	0.9994	0.0253	1.0006	0.0192
44.50	1.0052	0.0449	0.9977	0.0256	0.9992	0.0192
45.00	1.0048	0.0430	0.9964	0.0267	0.9984	0.0197
45.50	1.0043	0.0415	0.9960	0.0281	0.9981	0.0203
46.00	1.0037	0.0404	0.9965	0.0295	0.9979	0.0207
46.50	1.0033	0.0394	0.9977	0.0304	0.9979	0.0212
47.00	1.0030	0.0385	0.9993	0.0306	0.9980	0.0218
47.50	1.0027	0.0374	1.0009	0.0300	0.9987	0.0224
48.00	1.0022	0.0363	1.0020	0.0287	0.9999	0.0226
48.50	1.0014	0.0351	1.0025	0.0270	1.0012	0.0220
49.00	1.0006	0.0341	1.0022	0.0254	1.0020	0.0207
49.50	0.9990	0.0334	1.0013	0.0242	1.0019	0.0192
50.00	0.9975	0.0332	1.0002	0.0236	1.0011	0.0182

	MACH NUMBER 0.30 WIDTH TO LENGTH RATIO 0.0625		MACH NUMBER 0.30 WIDTH TO LENGTH RATIO 0.1250		MACH NUMBER 0.30 WIDTH TO LENGTH RATIO 0.2500	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.50	0.0027	0.0398	0.0054	0.0663	0.0108	0.1064
1.00	0.0105	0.0711	0.0210	0.1294	0.0418	0.2063
1.50	0.0224	0.1136	0.0448	0.1860	0.0893	0.2944
2.00	0.0373	0.1456	0.0744	0.2371	0.1479	0.3675
2.50	0.0537	0.1739	0.1071	0.2800	0.2122	0.4253
3.00	0.0707	0.1990	0.1406	0.3163	0.2777	0.4691
3.50	0.0875	0.2215	0.1742	0.3473	0.3415	0.5016
4.00	0.1040	0.2421	0.2066	0.3742	0.4025	0.5256
4.50	0.1202	0.2612	0.2383	0.3982	0.4607	0.5430
5.00	0.1362	0.2792	0.2695	0.4198	0.5167	0.5551
5.50	0.1522	0.2962	0.3005	0.4390	0.5709	0.5621
6.00	0.1683	0.3119	0.3313	0.4557	0.6230	0.5639
6.50	0.1842	0.3265	0.3616	0.4698	0.6723	0.5604
7.00	0.1997	0.3400	0.3909	0.4817	0.7180	0.5524
7.50	0.2147	0.3526	0.4188	0.4918	0.7592	0.5411
8.00	0.2292	0.3648	0.4455	0.5007	0.7960	0.5277
8.50	0.2434	0.3766	0.4711	0.5089	0.8289	0.5136
9.00	0.2574	0.3884	0.4961	0.5169	0.8589	0.4996
9.50	0.2716	0.4000	0.5212	0.5244	0.8873	0.4855
10.00	0.2862	0.4113	0.5466	0.5312	0.9146	0.4709
10.50	0.3012	0.4221	0.5725	0.5369	0.9412	0.4550
11.00	0.3165	0.4320	0.5986	0.5409	0.9665	0.4371
11.50	0.3318	0.4412	0.6245	0.5431	0.9897	0.4170
12.00	0.3471	0.4495	0.6498	0.5437	1.0102	0.3950
12.50	0.3622	0.4571	0.6742	0.5428	1.0275	0.3719
13.00	0.3769	0.4641	0.6976	0.5409	1.0414	0.3485
13.50	0.3915	0.4707	0.7200	0.5381	1.0525	0.3253
14.00	0.4058	0.4770	0.7417	0.5346	1.0609	0.3027
14.50	0.4201	0.4828	0.7627	0.5304	1.0672	0.2808
15.00	0.4342	0.4882	0.7830	0.5254	1.0715	0.2595
15.50	0.4482	0.4932	0.8025	0.5196	1.0737	0.2388
16.00	0.4619	0.4977	0.8212	0.5131	1.0737	0.2190
16.50	0.4753	0.5026	0.8388	0.5061	1.0717	0.2005
17.00	0.4885	0.5060	0.8555	0.4989	1.0678	0.1838
17.50	0.5016	0.5100	0.8715	0.4916	1.0626	0.1692
18.00	0.5146	0.5138	0.8869	0.4843	1.0569	0.1567
18.50	0.5278	0.5175	0.9021	0.4768	1.0512	0.1460
19.00	0.5411	0.5208	0.9171	0.4689	1.0458	0.1367
19.50	0.5545	0.5238	0.9318	0.4604	1.0408	0.1281
20.00	0.5680	0.5261	0.9462	0.4512	1.0358	0.1199
20.50	0.5813	0.5280	0.9598	0.4412	1.0304	0.1121
21.00	0.5943	0.5293	0.9725	0.4306	1.0244	0.1048
21.50	0.6071	0.5302	0.9842	0.4195	1.0178	0.0984
22.00	0.6195	0.5309	0.9949	0.4083	1.0106	0.0933
22.50	0.6316	0.5314	1.0047	0.3971	1.0032	0.0895
23.00	0.6435	0.5317	1.0137	0.3859	0.9961	0.0871
23.50	0.6552	0.5319	1.0222	0.3747	0.9894	0.0859
24.00	0.6669	0.5319	1.0300	0.3635	0.9833	0.0855
24.50	0.6785	0.5317	1.0371	0.3523	0.9776	0.0858
25.00	0.6897	0.5312	1.0435	0.3411	0.9724	0.0869
25.50	0.7009	0.5307	1.0492	0.3300	0.9676	0.0887
26.00	0.7119	0.5299	1.0544	0.3191	0.9635	0.0914
26.50	0.7229	0.5291	1.0590	0.3085	0.9602	0.0948
27.00	0.7339	0.5280	1.0633	0.2982	0.9581	0.0988
27.50	0.7448	0.5268	1.0673	0.2880	0.9573	0.1030
28.00	0.7557	0.5252	1.0711	0.2778	0.9578	0.1069
28.50	0.7665	0.5233	1.0745	0.2674	0.9592	0.1102
29.00	0.7771	0.5210	1.0775	0.2569	0.9611	0.1127
29.50	0.7874	0.5183	1.0797	0.2462	0.9633	0.1146
30.00	0.7974	0.5155	1.0813	0.2357	0.9654	0.1159
30.50	0.8070	0.5125	1.0821	0.2254	0.9674	0.1170
31.00	0.8163	0.5094	1.0822	0.2155	0.9694	0.1182
31.50	0.8254	0.5063	1.0819	0.2060	0.9716	0.1193
32.00	0.8344	0.5032	1.0813	0.1970	0.9742	0.1204
32.50	0.8432	0.5001	1.0803	0.1884	0.9771	0.1213
33.00	0.8519	0.4968	1.0792	0.1800	0.9804	0.1218
33.50	0.8605	0.4935	1.0777	0.1719	0.9839	0.1219
34.00	0.8690	0.4900	1.0760	0.1641	0.9874	0.1215
34.50	0.8773	0.4864	1.0738	0.1566	0.9909	0.1208
35.00	0.8855	0.4827	1.0714	0.1496	0.9944	0.1199
35.50	0.8937	0.4790	1.0689	0.1429	0.9980	0.1187
36.00	0.9017	0.4751	1.0662	0.1367	1.0018	0.1172
36.50	0.9098	0.4710	1.0635	0.1308	1.0057	0.1151
37.00	0.9177	0.4666	1.0608	0.1251	1.0096	0.1123
37.50	0.9254	0.4626	1.0580	0.1195	1.0132	0.1088
38.00	0.9329	0.4572	1.0550	0.1140	1.0162	0.1046
38.50	0.9401	0.4521	1.0517	0.1087	1.0184	0.1000
39.00	0.9469	0.4469	1.0481	0.1037	1.0197	0.0953
39.50	0.9534	0.4417	1.0442	0.0992	1.0203	0.0907
40.00	0.9596	0.4365	1.0402	0.0951	1.0204	0.0866
40.50	0.9656	0.4313	1.0361	0.0914	1.0201	0.0829
41.00	0.9714	0.4262	1.0320	0.0882	1.0197	0.0794
41.50	0.9771	0.4211	1.0280	0.0854	1.0192	0.0761
42.00	0.9826	0.4161	1.0240	0.0828	1.0186	0.0729
42.50	0.9880	0.4110	1.0201	0.0805	1.0177	0.0698
43.00	0.9933	0.4058	1.0162	0.0785	1.0166	0.0668
43.50	0.9984	0.4007	1.0123	0.0769	1.0153	0.0640
44.00	1.0034	0.3956	1.0085	0.0755	1.0137	0.0616
44.50	1.0083	0.3904	1.0049	0.0745	1.0121	0.0594
45.00	1.0131	0.3852	1.0014	0.0738	1.0105	0.0574
45.50	1.0178	0.3800	0.9982	0.0732	1.0089	0.0555
46.00	1.0225	0.3746	0.9951	0.0728	1.0073	0.0537
46.50	1.0267	0.3691	0.9922	0.0723	1.0055	0.0518
47.00	1.0312	0.3635	0.9892	0.0720	1.0033	0.0502
47.50	1.0352	0.3578	0.9862	0.0716	1.0008	0.0488
48.00	1.0390	0.3522	0.9832	0.0718	0.9980	0.0479
48.50	1.0426	0.3466	0.9802	0.0722	0.9952	0.0476
49.00	1.0460	0.3411	0.9774	0.0728	0.9925	0.0480
49.50	1.0494	0.3356	0.9748	0.0738	0.9902	0.0488
50.00	1.0526	0.3301	0.9724	0.0749	0.9883	0.0500

GENERALIZED FREQUENCY	MACH NUMBER 0.30 WIDTH TO LENGTH RATIO 0.5000		MACH NUMBER 0.30 WIDTH TO LENGTH RATIO 1.0000		MACH NUMBER 0.30 WIDTH TO LENGTH RATIO 2.0000	
	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.50	0.0214	0.1632	0.0429	0.2359	0.0839	0.3156
1.00	0.0632	0.3120	0.1626	0.4359	0.2974	0.5328
1.50	0.1762	0.4346	0.3346	0.5734	0.5505	0.6077
2.00	0.2808	0.5247	0.5263	0.6372	0.7575	0.5664
2.50	0.4085	0.5811	0.7062	0.6327	0.8809	0.4747
3.00	0.5252	0.6076	0.8513	0.5776	0.9359	0.3905
3.50	0.6322	0.6104	0.9515	0.4950	0.9610	0.3353
4.00	0.7265	0.5962	1.0084	0.4069	0.9838	0.2988
4.50	0.8082	0.5705	1.0317	0.3281	1.0085	0.2634
5.00	0.8782	0.5366	1.0337	0.2656	1.0259	0.2230
5.50	0.9376	0.4962	1.0250	0.2199	1.0299	0.1837
6.00	0.9862	0.4504	1.0124	0.1880	1.0238	0.1535
6.50	1.0233	0.4004	0.9993	0.1663	1.0153	0.1335
7.00	1.0478	0.3488	0.9869	0.1524	1.0087	0.1191
7.50	1.0598	0.2987	0.9761	0.1452	1.0027	0.1060
8.00	1.0605	0.2537	0.9684	0.1435	0.9938	0.0948
8.50	1.0528	0.2164	0.9654	0.1456	0.9818	0.0893
9.00	1.0403	0.1879	0.9679	0.1490	0.9708	0.0919
9.50	1.0266	0.1679	0.9754	0.1505	0.9663	0.1008
10.00	1.0141	0.1545	0.9857	0.1480	0.9710	0.1104
10.50	1.0040	0.1453	0.9958	0.1406	0.9826	0.1148
11.00	0.9961	0.1384	1.0030	0.1296	0.9955	0.1113
11.50	0.9895	0.1327	1.0057	0.1172	1.0047	0.1019
12.00	0.9834	0.1281	1.0041	0.1064	1.0080	0.0911
12.50	0.9774	0.1249	1.0000	0.0989	1.0075	0.0827
13.00	0.9720	0.1238	0.9957	0.0952	1.0062	0.0774
13.50	0.9677	0.1246	0.9932	0.0944	1.0062	0.0734
14.00	0.9655	0.1269	0.9935	0.0947	1.0070	0.0687
14.50	0.9655	0.1296	0.9963	0.0940	1.0067	0.0629
15.00	0.9674	0.1319	1.0002	0.0911	1.0043	0.0573
15.50	0.9707	0.1331	1.0034	0.0858	1.0003	0.0535
16.00	0.9744	0.1333	1.0045	0.0790	0.9963	0.0522
16.50	0.9781	0.1327	1.0030	0.0724	0.9934	0.0523
17.00	0.9818	0.1321	0.9992	0.0675	0.9916	0.0531
17.50	0.9859	0.1315	0.9944	0.0652	0.9905	0.0541
18.00	0.9909	0.1307	0.9903	0.0657	0.9900	0.0557
18.50	0.9970	0.1291	0.9880	0.0681	0.9908	0.0580
19.00	1.0040	0.1259	0.9882	0.0712	0.9935	0.0600
19.50	1.0110	0.1206	0.9907	0.0736	0.9981	0.0605
20.00	1.0169	0.1130	0.9947	0.0743	1.0030	0.0583
20.50	1.0208	0.1037	0.9991	0.0730	1.0065	0.0536
21.00	1.0221	0.0936	1.0030	0.0700	1.0074	0.0480
21.50	1.0208	0.0843	1.0057	0.0658	1.0058	0.0434
22.00	1.0173	0.0762	1.0069	0.0611	1.0032	0.0408
22.50	1.0126	0.0699	1.0069	0.0564	1.0012	0.0399
23.00	1.0074	0.0654	1.0056	0.0521	1.0004	0.0395
23.50	1.0021	0.0625	1.0034	0.0486	1.0001	0.0386
24.00	0.9970	0.0608	1.0004	0.0460	0.9995	0.0371
24.50	0.9922	0.0604	0.9970	0.0448	0.9980	0.0359
25.00	0.9877	0.0611	0.9937	0.0451	0.9960	0.0357
25.50	0.9838	0.0630	0.9911	0.0463	0.9945	0.0367
26.00	0.9809	0.0662	0.9899	0.0496	0.9942	0.0383
26.50	0.9795	0.0702	0.9906	0.0528	0.9950	0.0397
27.00	0.9801	0.0744	0.9931	0.0553	0.9966	0.0404
27.50	0.9824	0.0782	0.9970	0.0563	0.9983	0.0405
28.00	0.9862	0.0807	1.0013	0.0553	1.0002	0.0399
28.50	0.9908	0.0815	1.0049	0.0523	1.0020	0.0388
29.00	0.9953	0.0807	1.0071	0.0480	1.0037	0.0369
29.50	0.9992	0.0786	1.0073	0.0433	1.0046	0.0342
30.00	1.0021	0.0757	1.0056	0.0392	1.0044	0.0313
30.50	1.0040	0.0726	1.0026	0.0365	1.0030	0.0288
31.00	1.0053	0.0696	0.9996	0.0355	1.0009	0.0275
31.50	1.0062	0.0668	0.9969	0.0359	0.9999	0.0275
32.00	1.0068	0.0641	0.9952	0.0373	0.9979	0.0282
32.50	1.0072	0.0613	0.9947	0.0389	0.9977	0.0289
33.00	1.0073	0.0583	0.9952	0.0402	0.9980	0.0289
33.50	1.0068	0.0554	0.9963	0.0409	0.9979	0.0286
34.00	1.0057	0.0528	0.9976	0.0409	0.9975	0.0284
34.50	1.0041	0.0506	0.9988	0.0405	0.9969	0.0288
35.00	1.0024	0.0491	0.9997	0.0397	0.9969	0.0298
35.50	1.0008	0.0483	1.0004	0.0387	0.9979	0.0307
36.00	0.9995	0.0478	1.0010	0.0377	0.9995	0.0310
36.50	0.9986	0.0474	1.0013	0.0366	1.0011	0.0303
37.00	0.9979	0.0469	1.0015	0.0353	1.0024	0.0289
37.50	0.9971	0.0463	1.0013	0.0341	1.0029	0.0272
38.00	0.9961	0.0457	1.0008	0.0330	1.0029	0.0255
38.50	0.9947	0.0454	1.0001	0.0322	1.0024	0.0241
39.00	0.9933	0.0457	0.9994	0.0319	1.0017	0.0229
39.50	0.9920	0.0465	0.9988	0.0319	1.0006	0.0220
40.00	0.9913	0.0480	0.9987	0.0321	0.9993	0.0216
40.50	0.9913	0.0497	0.9989	0.0322	0.9981	0.0220
41.00	0.9921	0.0513	0.9993	0.0320	0.9974	0.0228
41.50	0.9936	0.0526	0.9997	0.0315	0.9974	0.0237
42.00	0.9955	0.0532	0.9998	0.0306	0.9980	0.0242
42.50	0.9975	0.0532	0.9995	0.0298	0.9986	0.0242
43.00	0.9995	0.0527	0.9989	0.0294	0.9990	0.0239
43.50	1.0014	0.0518	0.9982	0.0294	0.9990	0.0237
44.00	1.0031	0.0506	0.9973	0.0298	0.9991	0.0239
44.50	1.0047	0.0491	0.9979	0.0306	0.9997	0.0241
45.00	1.0060	0.0471	0.9987	0.0312	1.0007	0.0241
45.50	1.0071	0.0447	0.9997	0.0313	1.0010	0.0233
46.00	1.0075	0.0420	1.0012	0.0307	1.0025	0.0220
46.50	1.0073	0.0391	1.0023	0.0294	1.0024	0.0204
47.00	1.0062	0.0364	1.0027	0.0276	1.0017	0.0192
47.50	1.0043	0.0343	1.0025	0.0260	1.0007	0.0184
48.00	1.0021	0.0328	1.0015	0.0246	0.9997	0.0182
48.50	0.9997	0.0323	1.0002	0.0238	0.9989	0.0183
49.00	0.9975	0.0325	0.9989	0.0237	0.9983	0.0187
49.50	0.9958	0.0332	0.9976	0.0241	0.9980	0.0192
50.00	0.9947	0.0343	0.9971	0.0249	0.9979	0.0198

	MACH NUMBER 0.40 WIDTH TO LENGTH RATIO 0.0625		MACH NUMBER 0.40 WIDTH TO LENGTH RATIO 0.1250		MACH NUMBER 0.40 WIDTH TO LENGTH RATIO 0.2500	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.50	0.0029	0.0402	0.0058	0.0669	0.0117	0.1076
1.00	0.0112	0.0784	0.0224	0.1300	0.0447	0.2073
1.50	0.0235	0.1134	0.0470	0.1864	0.0937	0.2933
2.00	0.0383	0.1446	0.0765	0.2351	0.1520	0.3633
2.50	0.0541	0.1723	0.1080	0.2767	0.2138	0.4183
3.00	0.0701	0.1972	0.1397	0.3126	0.2752	0.4614
3.50	0.0860	0.2202	0.1712	0.3445	0.3352	0.4959
4.00	0.1020	0.2417	0.2027	0.3734	0.3943	0.5237
4.50	0.1184	0.2619	0.2347	0.3995	0.4533	0.5454
5.00	0.1352	0.2806	0.2675	0.4224	0.5122	0.5601
5.50	0.1522	0.2976	0.3003	0.4418	0.5700	0.5673
6.00	0.1689	0.3129	0.3325	0.4576	0.6247	0.5673
6.50	0.1850	0.3269	0.3631	0.4704	0.6747	0.5613
7.00	0.2003	0.3399	0.3920	0.4814	0.7193	0.5514
7.50	0.2150	0.3524	0.4192	0.4912	0.7589	0.5398
8.00	0.2293	0.3648	0.4455	0.5005	0.7949	0.5273
8.50	0.2436	0.3769	0.4714	0.5093	0.8284	0.5144
9.00	0.2581	0.3887	0.4972	0.5172	0.8600	0.5003
9.50	0.2727	0.3999	0.5231	0.5240	0.8898	0.4847
10.00	0.2873	0.4105	0.5486	0.5294	0.9171	0.4674
10.50	0.3019	0.4206	0.5736	0.5337	0.9418	0.4490
11.00	0.3163	0.4303	0.5981	0.5371	0.9637	0.4302
11.50	0.3309	0.4396	0.6222	0.5398	0.9835	0.4113
12.00	0.3456	0.4486	0.6463	0.5410	1.0017	0.3923
12.50	0.3606	0.4570	0.6705	0.5426	1.0188	0.3728
13.00	0.3757	0.4647	0.6946	0.5420	1.0344	0.3522
13.50	0.3908	0.4716	0.7183	0.5398	1.0480	0.3303
14.00	0.4057	0.4778	0.7411	0.5362	1.0587	0.3074
14.50	0.4202	0.4833	0.7627	0.5313	1.0662	0.2844
15.00	0.4344	0.4885	0.7831	0.5258	1.0707	0.2621
15.50	0.4482	0.4934	0.8024	0.5198	1.0727	0.2411
16.00	0.4620	0.4980	0.8210	0.5134	1.0728	0.2216
16.50	0.4756	0.5024	0.8389	0.5065	1.0715	0.2034
17.00	0.4892	0.5064	0.8562	0.4991	1.0687	0.1864
17.50	0.5026	0.5100	0.8726	0.4912	1.0646	0.1705
18.00	0.5157	0.5132	0.8880	0.4829	1.0589	0.1562
18.50	0.5287	0.5163	0.9027	0.4745	1.0521	0.1438
19.00	0.5414	0.5192	0.9166	0.4661	1.0448	0.1335
19.50	0.5542	0.5220	0.9302	0.4576	1.0375	0.1253
20.00	0.5669	0.5246	0.9435	0.4490	1.0308	0.1186
20.50	0.5798	0.5270	0.9565	0.4400	1.0247	0.1128
21.00	0.5927	0.5289	0.9692	0.4304	1.0191	0.1075
21.50	0.6055	0.5304	0.9812	0.4202	1.0134	0.1026
22.00	0.6182	0.5315	0.9924	0.4095	1.0076	0.0983
22.50	0.6307	0.5322	1.0026	0.3986	1.0016	0.0949
23.00	0.6430	0.5327	1.0124	0.3875	0.9957	0.0924
23.50	0.6552	0.5329	1.0214	0.3763	0.9901	0.0909
24.00	0.6673	0.5327	1.0297	0.3650	0.9851	0.0900
24.50	0.6772	0.5322	1.0373	0.3534	0.9804	0.0896
25.00	0.6908	0.5313	1.0441	0.3416	0.9758	0.0895
25.50	0.7020	0.5302	1.0499	0.3298	0.9713	0.0899
26.00	0.7129	0.5290	1.0548	0.3183	0.9668	0.0913
26.50	0.7235	0.5277	1.0589	0.3073	0.9628	0.0936
27.00	0.7340	0.5264	1.0626	0.2967	0.9597	0.0969
27.50	0.7444	0.5251	1.0660	0.2865	0.9577	0.1008
28.00	0.7547	0.5237	1.0692	0.2765	0.9570	0.1048
28.50	0.7651	0.5220	1.0721	0.2665	0.9573	0.1086
29.00	0.7754	0.5202	1.0747	0.2565	0.9584	0.1120
29.50	0.7855	0.5181	1.0768	0.2465	0.9601	0.1151
30.00	0.7956	0.5158	1.0784	0.2366	0.9622	0.1178
30.50	0.8055	0.5134	1.0795	0.2270	0.9649	0.1203
31.00	0.8153	0.5107	1.0803	0.2176	0.9682	0.1224
31.50	0.8250	0.5078	1.0807	0.2083	0.9721	0.1238
32.00	0.8346	0.5046	1.0800	0.1992	0.9763	0.1243
32.50	0.8440	0.5011	1.0804	0.1901	0.9804	0.1240
33.00	0.8531	0.4973	1.0795	0.1812	0.9841	0.1230
33.50	0.8618	0.4935	1.0780	0.1726	0.9874	0.1217
34.00	0.8701	0.4893	1.0760	0.1645	0.9902	0.1204
34.50	0.8782	0.4855	1.0737	0.1569	0.9930	0.1191
35.00	0.8861	0.4813	1.0712	0.1497	0.9958	0.1178
35.50	0.8938	0.4772	1.0685	0.1429	0.9988	0.1163
36.00	0.9014	0.4732	1.0657	0.1365	1.0018	0.1144
36.50	0.9089	0.4690	1.0627	0.1303	1.0047	0.1122
37.00	0.9162	0.4646	1.0595	0.1245	1.0073	0.1097
37.50	0.9234	0.4606	1.0561	0.1191	1.0097	0.1070
38.00	0.9305	0.4564	1.0526	0.1142	1.0120	0.1043
38.50	0.9375	0.4521	1.0491	0.1098	1.0142	0.1015
39.00	0.9445	0.4476	1.0458	0.1056	1.0165	0.0983
39.50	0.9515	0.4430	1.0425	0.1016	1.0186	0.0947
40.00	0.9583	0.4381	1.0392	0.0977	1.0203	0.0906
40.50	0.9648	0.4331	1.0358	0.0939	1.0214	0.0861
41.00	0.9712	0.4279	1.0322	0.0904	1.0217	0.0816
41.50	0.9772	0.4226	1.0284	0.0871	1.0214	0.0772
42.00	0.9831	0.4173	1.0246	0.0842	1.0206	0.0732
42.50	0.9887	0.4119	1.0207	0.0817	1.0194	0.0694
43.00	0.9942	0.4065	1.0169	0.0795	1.0179	0.0660
43.50	0.9995	0.4010	1.0130	0.0775	1.0162	0.0627
44.00	1.0046	0.3954	1.0091	0.0757	1.0140	0.0598
44.50	1.0093	0.3897	1.0052	0.0743	1.0115	0.0573
45.00	1.0139	0.3841	1.0013	0.0733	1.0088	0.0554
45.50	1.0182	0.3786	0.9974	0.0728	1.0061	0.0542
46.00	1.0224	0.3731	0.9938	0.0726	1.0038	0.0536
46.50	1.0265	0.3677	0.9905	0.0727	1.0018	0.0531
47.00	1.0305	0.3622	0.9876	0.0730	1.0002	0.0520
47.50	1.0343	0.3568	0.9848	0.0734	0.9988	0.0523
48.00	1.0380	0.3513	0.9822	0.0738	0.9973	0.0518
48.50	1.0415	0.3458	0.9797	0.0743	0.9956	0.0514
49.00	1.0446	0.3403	0.9774	0.0749	0.9939	0.0512
49.50	1.0482	0.3349	0.9752	0.0757	0.9922	0.0513
50.00	1.0511	0.3275	0.9732	0.0766	0.9907	0.0517

	MACH NUMBER 0.40 WIDTH TO LENGTH RATIO 0.5000		MACH NUMBER 0.40 WIDTH TO LENGTH RATIO 1.0000		MACH NUMBER 0.40 WIDTH TO LENGTH RATIO 2.0000	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.50	0.0233	0.1654	0.0463	0.2395	0.0903	0.3204
1.00	0.0887	0.3136	0.1731	0.4370	0.3142	0.5291
1.50	0.1847	0.4317	0.3491	0.5645	0.5655	0.5849
2.00	0.2963	0.5151	0.5357	0.6153	0.7529	0.5303
2.50	0.4103	0.5663	0.7004	0.6027	0.8508	0.4441
3.00	0.5183	0.5915	0.8272	0.5507	0.8913	0.3818
3.50	0.6172	0.5989	0.9135	0.4833	0.9194	0.3506
4.00	0.7077	0.5932	0.9683	0.4160	0.9569	0.3289
4.50	0.7912	0.5763	1.0021	0.3550	0.9982	0.2972
5.00	0.8674	0.5479	1.0220	0.3003	1.0291	0.2533
5.50	0.9341	0.5080	1.0303	0.2507	1.0424	0.2066
6.00	0.9876	0.4586	1.0274	0.2076	1.0409	0.1663
6.50	1.0257	0.4040	1.0151	0.1742	1.0313	0.1362
7.00	1.0481	0.3495	0.9980	0.1534	1.0187	0.1157
7.50	1.0573	0.2996	0.9823	0.1450	1.0060	0.1026
8.00	1.0571	0.2571	0.9732	0.1449	0.9945	0.0953
8.50	1.0515	0.2220	0.9722	0.1474	0.9851	0.0926
9.00	1.0428	0.1934	0.9772	0.1473	0.9787	0.0933
9.50	1.0320	0.1700	0.9840	0.1426	0.9759	0.0958
10.00	1.0194	0.1514	0.9889	0.1344	0.9765	0.0982
10.50	1.0055	0.1379	0.9901	0.1257	0.9790	0.0992
11.00	0.9914	0.1300	0.9887	0.1191	0.9819	0.0991
11.50	0.9791	0.1275	0.9869	0.1156	0.9851	0.0990
12.00	0.9703	0.1290	0.9867	0.1144	0.9895	0.0993
12.50	0.9658	0.1323	0.9889	0.1137	0.9961	0.0984
13.00	0.9650	0.1354	0.9929	0.1119	1.0039	0.0945
13.50	0.9664	0.1370	0.9973	0.1084	1.0107	0.0870
14.00	0.9685	0.1371	1.0012	0.1035	1.0140	0.0770
14.50	0.9705	0.1365	1.0039	0.0978	1.0131	0.0673
15.00	0.9724	0.1361	1.0058	0.0921	1.0093	0.0602
15.50	0.9749	0.1361	1.0069	0.0863	1.0049	0.0562
16.00	0.9785	0.1360	1.0074	0.0802	1.0016	0.0545
16.50	0.9832	0.1351	1.0067	0.0738	0.9998	0.0531
17.00	0.9883	0.1326	1.0042	0.0676	0.9984	0.0512
17.50	0.9929	0.1291	0.9997	0.0627	0.9962	0.0491
18.00	0.9965	0.1248	0.9940	0.0602	0.9929	0.0482
18.50	0.9992	0.1206	0.9885	0.0606	0.9897	0.0494
19.00	1.0016	0.1169	0.9844	0.0642	0.9882	0.0525
19.50	1.0043	0.1135	0.9835	0.0690	0.9894	0.0559
20.00	1.0076	0.1075	0.9859	0.0735	0.9927	0.0580
20.50	1.0110	0.1045	0.9906	0.0760	0.9968	0.0579
21.00	1.0136	0.0982	0.9966	0.0758	1.0004	0.0558
21.50	1.0147	0.0911	1.0019	0.0730	1.0026	0.0528
22.00	1.0140	0.0840	1.0057	0.0686	1.0036	0.0499
22.50	1.0117	0.0777	1.0077	0.0635	1.0041	0.0474
23.00	1.0085	0.0727	1.0081	0.0585	1.0046	0.0452
23.50	1.0050	0.0689	1.0074	0.0539	1.0050	0.0427
24.00	1.0015	0.0666	1.0057	0.0499	1.0050	0.0398
24.50	0.9975	0.0657	1.0032	0.0466	1.0041	0.0369
25.00	0.9937	0.0621	1.0006	0.0443	1.0021	0.0344
25.50	0.9894	0.0618	0.9965	0.0439	0.9996	0.0330
26.00	0.9855	0.0636	0.9935	0.0449	0.9971	0.0329
26.50	0.9821	0.0657	0.9918	0.0471	0.9952	0.0337
27.00	0.9805	0.0695	0.9913	0.0496	0.9942	0.0351
27.50	0.9808	0.0736	0.9934	0.0515	0.9941	0.0366
28.00	0.9828	0.0771	0.9960	0.0521	0.9948	0.0376
28.50	0.9860	0.0794	0.9985	0.0513	0.9960	0.0385
29.00	0.9897	0.0805	1.0003	0.0494	0.9975	0.0386
29.50	0.9935	0.0806	1.0010	0.0473	0.9988	0.0381
30.00	0.9973	0.0799	1.0010	0.0454	1.0001	0.0374
30.50	1.0011	0.0785	1.0007	0.0442	1.0011	0.0365
31.00	1.0049	0.0762	1.0006	0.0433	1.0021	0.0355
31.50	1.0083	0.0729	1.0007	0.0426	1.0031	0.0341
32.00	1.0109	0.0685	1.0010	0.0416	1.0039	0.0323
32.50	1.0122	0.0634	1.0011	0.0405	1.0041	0.0300
33.00	1.0120	0.0583	1.0010	0.0392	1.0034	0.0277
33.50	1.0104	0.0537	1.0006	0.0382	1.0018	0.0259
34.00	1.0080	0.0502	1.0001	0.0374	0.9998	0.0252
34.50	1.0052	0.0479	0.9997	0.0368	0.9981	0.0254
35.00	1.0025	0.0464	0.9995	0.0362	0.9971	0.0263
35.50	1.0000	0.0455	0.9992	0.0355	0.9969	0.0271
36.00	0.9978	0.0451	0.9986	0.0347	0.9971	0.0275
36.50	0.9956	0.0451	0.9977	0.0342	0.9972	0.0276
37.00	0.9935	0.0457	0.9967	0.0343	0.9971	0.0278
37.50	0.9917	0.0470	0.9959	0.0351	0.9971	0.0284
38.00	0.9910	0.0487	0.9910	0.0363	0.9976	0.0292
38.50	0.9911	0.0505	0.9966	0.0376	0.9989	0.0297
39.00	0.9919	0.0519	0.9985	0.0382	1.0005	0.0295
39.50	0.9932	0.0528	1.0003	0.0380	1.0021	0.0284
40.00	0.9947	0.0530	1.0022	0.0367	1.0029	0.0267
40.50	0.9959	0.0527	1.0034	0.0348	1.0030	0.0249
41.00	0.9969	0.0523	1.0037	0.0327	1.0024	0.0236
41.50	0.9978	0.0519	1.0034	0.0307	1.0017	0.0227
42.00	0.9987	0.0514	1.0025	0.0291	1.0011	0.0221
42.50	0.9998	0.0509	1.0014	0.0279	1.0006	0.0216
43.00	1.0009	0.0500	1.0002	0.0271	1.0000	0.0211
43.50	1.0019	0.0487	0.9988	0.0268	0.9993	0.0208
44.00	1.0025	0.0473	0.9974	0.0269	0.9984	0.0207
44.50	1.0027	0.0459	0.9963	0.0277	0.9977	0.0211
45.00	1.0027	0.0446	0.9957	0.0289	0.9972	0.0218
45.50	1.0027	0.0437	0.9958	0.0303	0.9972	0.0226
46.00	1.0027	0.0429	0.9967	0.0315	0.9976	0.0233
46.50	1.0030	0.0418	0.9982	0.0321	0.9983	0.0238
47.00	1.0031	0.0405	1.0000	0.0319	0.9993	0.0239
47.50	1.0030	0.0391	1.0014	0.0308	1.0003	0.0236
48.00	1.0025	0.0376	1.0022	0.0293	1.0011	0.0229
48.50	1.0015	0.0363	1.0024	0.0276	1.0016	0.0220
49.00	1.0004	0.0355	1.0020	0.0265	1.0016	0.0211
49.50	0.9992	0.0350	1.0014	0.0256	1.0017	0.0203
50.00	0.9991	0.0349	1.0005	0.0251	1.0015	0.0196

	MACH NUMBER 0.50 WIDTH TO LENGTH RATIO 0.0625		MACH NUMBER 0.50 WIDTH TO LENGTH RATIO 0.1250		MACH NUMBER 0.50 WIDTH TO LENGTH RATIO 0.2500	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.50	0.0032	0.0406	0.0065	0.0678	0.0130	0.1093
1.00	0.0122	0.0787	0.0244	0.1305	0.0487	0.2083
1.50	0.0249	0.1129	0.0498	0.1853	0.0992	0.2909
2.00	0.0394	0.1431	0.0786	0.2320	0.1560	0.3568
2.50	0.0541	0.1703	0.1080	0.2726	0.2134	0.4097
3.00	0.0690	0.1955	0.1374	0.3092	0.2702	0.4543
3.50	0.0844	0.2195	0.1677	0.3431	0.3279	0.4927
4.00	0.1006	0.2420	0.1998	0.3740	0.3880	0.5243
4.50	0.1177	0.2626	0.2333	0.4008	0.4498	0.5475
5.00	0.1351	0.2811	0.2671	0.4232	0.5109	0.5611
5.50	0.1521	0.2976	0.3000	0.4416	0.5685	0.5665
6.00	0.1684	0.3128	0.3313	0.4571	0.6214	0.5660
6.50	0.1841	0.3272	0.3613	0.4708	0.6699	0.5618
7.00	0.1996	0.3409	0.3904	0.4831	0.7151	0.5548
7.50	0.2150	0.3538	0.4191	0.4938	0.7577	0.5447
8.00	0.2303	0.3659	0.4472	0.5026	0.7971	0.5314
8.50	0.2451	0.3773	0.4742	0.5098	0.8326	0.5152
9.00	0.2595	0.3881	0.4998	0.5159	0.8636	0.4976
9.50	0.2735	0.3988	0.5245	0.5215	0.8908	0.4800
10.00	0.2876	0.4094	0.5488	0.5269	0.9156	0.4629
10.50	0.3018	0.4197	0.5731	0.5317	0.9389	0.4458
11.00	0.3164	0.4296	0.5976	0.5355	0.9609	0.4279
11.50	0.3310	0.4388	0.6219	0.5381	0.9809	0.4088
12.00	0.3455	0.4475	0.6457	0.5394	0.9986	0.3890
12.50	0.3600	0.4557	0.6696	0.5399	1.0139	0.3691
13.00	0.3746	0.4636	0.6921	0.5397	1.0274	0.3496
13.50	0.3893	0.4711	0.7150	0.5386	1.0396	0.3300
14.00	0.4042	0.4780	0.7377	0.5362	1.0506	0.3099
14.50	0.4192	0.4840	0.7599	0.5323	1.0596	0.2889
15.00	0.4339	0.4894	0.7812	0.5272	1.0660	0.2675
15.50	0.4483	0.4941	0.8013	0.5211	1.0697	0.2465
16.00	0.4623	0.4985	0.8204	0.5145	1.0709	0.2266
16.50	0.4760	0.5026	0.8387	0.5074	1.0704	0.2081
17.00	0.4896	0.5063	0.8562	0.4998	1.0685	0.1907
17.50	0.5030	0.5098	0.8729	0.4915	1.0652	0.1742
18.00	0.5161	0.5129	0.8886	0.4827	1.0602	0.1589
18.50	0.5289	0.5158	0.9032	0.4737	1.0536	0.1453
19.00	0.5416	0.5187	0.9169	0.4647	1.0459	0.1340
19.50	0.5543	0.5214	0.9301	0.4559	1.0380	0.1249
20.00	0.5670	0.5239	0.9429	0.4470	1.0304	0.1176
20.50	0.5798	0.5261	0.9554	0.4378	1.0232	0.1115
21.00	0.5925	0.5279	0.9673	0.4281	1.0163	0.1063
21.50	0.6051	0.5293	0.9783	0.4182	1.0094	0.1023
22.00	0.6175	0.5305	0.9891	0.4002	1.0028	0.0994
22.50	0.6298	0.5315	0.9991	0.3982	0.9968	0.0977
23.00	0.6420	0.5322	1.0089	0.3880	0.9917	0.0968
23.50	0.6543	0.5326	1.0183	0.3775	0.9874	0.0961
24.00	0.6663	0.5325	1.0272	0.3665	0.9836	0.0954
24.50	0.6782	0.5321	1.0353	0.3550	0.9799	0.0948
25.00	0.6897	0.5315	1.0424	0.3434	0.9760	0.0947
25.50	0.7011	0.5307	1.0487	0.3318	0.9724	0.0953
26.00	0.7123	0.5297	1.0542	0.3203	0.9693	0.0964
26.50	0.7234	0.5285	1.0591	0.3088	0.9667	0.0979
27.00	0.7344	0.5270	1.0633	0.2975	0.9647	0.0995
27.50	0.7451	0.5253	1.0667	0.2862	0.9628	0.1012
28.00	0.7555	0.5233	1.0693	0.2754	0.9611	0.1033
28.50	0.7657	0.5213	1.0714	0.2650	0.9598	0.1061
29.00	0.7757	0.5192	1.0732	0.2551	0.9593	0.1094
29.50	0.7856	0.5170	1.0747	0.2455	0.9599	0.1129
30.00	0.7954	0.5146	1.0761	0.2361	0.9614	0.1161
30.50	0.8050	0.5121	1.0771	0.2267	0.9636	0.1188
31.00	0.8145	0.5094	1.0776	0.2175	0.9663	0.1212
31.50	0.8236	0.5066	1.0776	0.2086	0.9694	0.1233
32.00	0.8336	0.5037	1.0777	0.2000	0.9731	0.1251
32.50	0.8423	0.5007	1.0774	0.1917	0.9773	0.1262
33.00	0.8514	0.4974	1.0768	0.1834	0.9820	0.1264
33.50	0.8604	[illegible]	1.0760	0.1752	0.9866	0.1256
34.00	0.8691	0.4900	1.0747	0.1671	0.9908	0.1242
34.50	0.8775	0.4861	1.0729	0.1593	0.9947	0.1223
35.00	0.8857	0.4820	1.0708	0.1519	0.9982	0.1201
35.50	0.8938	0.4779	1.0685	0.1449	1.0017	0.1177
36.00	0.9016	0.4736	1.0659	0.1381	1.0049	0.1148
36.50	0.9093	0.4692	1.0631	0.1316	1.0076	0.1114
37.00	0.9167	0.4647	1.0599	0.1253	1.0097	0.1078
37.50	0.9237	0.4601	1.0563	0.1195	1.0112	0.1044
38.00	0.9308	0.4554	1.0525	0.1142	1.0123	0.1013
38.50	0.9376	0.4508	1.0486	0.1095	1.0133	0.0984
39.00	0.9443	0.4462	1.0448	0.1052	1.0145	0.0956
39.50	0.9508	0.4415	1.0410	0.1013	1.0157	0.0926
40.00	0.9571	0.4366	1.0372	0.0977	1.0166	0.0894
40.50	0.9633	0.4318	1.0334	0.0944	1.0172	0.0862
41.00	0.9693	0.4269	1.0296	0.0916	1.0176	0.0830
41.50	0.9752	0.4221	1.0259	0.0891	1.0178	0.0799
42.00	0.9810	0.4172	1.0226	0.0868	1.0179	0.0767
42.50	0.9868	0.4121	1.0193	0.0846	1.0179	0.0733
43.00	0.9924	0.4070	1.0161	0.0824	1.0175	0.0698
43.50	0.9978	0.4017	1.0128	0.0803	1.0165	0.0663
44.00	1.0031	0.3964	1.0093	0.0785	1.0150	0.0630
44.50	1.0082	0.3910	1.0058	0.0769	1.0132	0.0602
45.00	1.0131	0.3855	1.0023	0.0755	1.0113	0.0576
45.50	1.0179	0.3799	0.9989	0.0745	1.0092	0.0553
46.00	1.0225	0.3742	0.9954	0.0737	1.0068	0.0532
46.50	1.0267	0.3684	0.9920	0.0731	1.0040	0.0514
47.00	1.0307	0.3626	0.9885	0.0728	1.0010	0.0503
47.50	1.0345	0.3570	0.9851	0.0729	0.9981	0.0499
48.00	1.0381	0.3513	0.9820	0.0734	0.9954	0.0501
48.50	1.0416	0.3458	0.9791	0.0742	0.9932	0.0507
49.00	1.0450	0.3402	0.9763	0.0751	0.9913	0.0514
49.50	1.0482	0.3346	0.9741	0.0762	0.9897	0.0522
50.00	1.0512	0.3290	0.9719	0.0774	0.9883	0.0532

GENERALIZED FREQUENCY	MACH NUMBER 0.50 WIDTH TO LENGTH RATIO 0.5000 RADIATION RESISTANCE	RADIATION REACTANCE	MACH NUMBER 0.50 WIDTH TO LENGTH RATIO 1.0000 RADIATION RESISTANCE	RADIATION REACTANCE	MACH NUMBER 0.50 WIDTH TO LENGTH RATIO 2.0000 RADIATION RESISTANCE	RADIATION REACTANCE
0.50	0.0259	0.1684	0.0514	0.2444	0.1001	0.3267
1.00	0.0967	0.3147	0.1880	0.4368	0.3374	0.5206
1.50	0.1953	0.4258	0.3666	0.5488	0.5798	0.5494
2.00	0.3030	0.5008	0.5413	0.5840	0.7349	0.4845
2.50	0.4076	0.5478	0.6843	[illegible]	0.8026	0.4161
3.00	0.5058	0.5767	0.7913	0.5292	0.8386	0.3895
3.50	0.6000	0.5925	0.8720	0.4838	0.8851	0.3811
4.00	0.6924	0.5948	0.9361	0.4346	0.9452	0.3618
4.50	0.7813	0.5811	0.9854	0.3796	0.9990	0.3204
5.00	0.8614	0.5510	1.0159	0.3205	1.0310	0.2669
5.50	0.9274	0.5033	1.0260	0.2651	1.0404	0.2167
6.00	0.9774	0.4592	1.0209	0.2221	1.0361	0.1793
6.50	1.0131	0.4093	1.0101	0.1942	1.0292	0.1547
7.00	1.0378	0.3610	1.0017	0.1777	1.0250	0.1365
7.50	1.0538	0.3144	0.9982	0.1657	1.0219	0.1186
8.00	1.0611	0.2697	0.9968	0.1537	1.0150	0.1007
8.50	1.0594	0.2283	0.9942	0.1418	1.0027	0.0871
9.00	1.0494	0.1932	0.9894	0.1324	0.9883	0.0817
9.50	1.0341	0.1666	0.9846	0.1269	0.9772	0.0839
10.00	1.0174	0.1489	0.9819	0.1243	0.9725	0.0898
10.50	1.0022	0.1380	0.9817	0.1220	0.9734	0.0948
11.00	0.9894	0.1316	0.9824	0.1197	0.9770	0.0968
11.50	0.9784	0.1281	0.9821	0.1151	0.9804	0.0967
12.00	0.9689	0.1275	0.9809	0.1130	0.9831	0.0964
12.50	0.9614	0.1301	0.9804	0.1134	0.9864	0.0970
13.00	0.9574	0.1351	0.9826	0.1153	0.9920	0.0973
13.50	0.9575	0.1407	0.9882	0.1164	0.9995	0.0953
14.00	0.9612	0.1450	0.9958	0.1145	1.0066	0.0897
14.50	0.9668	0.1467	1.0030	0.1073	1.0113	0.0815
15.00	0.9726	0.1462	1.0082	0.1018	1.0125	0.0730
15.50	0.9778	0.1446	1.0110	0.0936	1.0112	0.0659
16.00	0.9830	0.1420	1.0117	0.0858	1.0091	0.0609
16.50	0.9885	0.1400	1.0115	0.0783	1.0075	0.0569
17.00	0.9943	0.1360	1.0096	0.0710	1.0059	0.0529
17.50	0.9994	0.1304	1.0059	0.0645	1.0034	0.0488
18.00	1.0028	0.1238	1.0003	0.0598	0.9993	0.0457
18.50	1.0044	0.1173	0.9939	0.0581	0.9946	0.0448
19.00	1.0049	0.1119	0.9883	0.0596	0.9909	0.0464
19.50	1.0054	0.1075	0.9852	0.0631	0.9893	0.0492
20.00	1.0062	0.1033	0.9850	0.0673	0.9897	0.0516
20.50	1.0070	0.0986	0.9870	0.0700	0.9912	0.0528
21.00	1.0071	0.0939	0.9899	0.0713	0.9926	0.0531
21.50	1.0063	0.0893	0.9931	0.0715	0.9937	0.0533
22.00	1.0048	0.0855	0.9963	0.0708	0.9952	0.0539
22.50	1.0035	0.0826	0.9997	0.0694	0.9977	0.0543
23.00	1.0026	0.0801	1.0030	0.0667	1.0010	0.0535
23.50	1.0019	0.0772	1.0055	0.0627	1.0042	0.0509
24.00	1.0008	0.0741	1.0064	0.0581	1.0061	0.0472
24.50	0.9987	0.0711	1.0055	0.0536	1.0064	0.0434
25.00	0.9960	0.0692	1.0035	0.0509	1.0056	0.0403
25.50	0.9933	0.0684	1.0016	0.0493	1.0046	0.0382
26.00	0.9912	0.0685	1.0003	0.0486	1.0038	0.0364
26.50	0.9898	0.0689	0.9996	0.0479	1.0029	0.0345
27.00	0.9887	0.0692	0.9992	0.0470	1.0014	0.0325
27.50	0.9877	0.0699	0.9985	0.0460	0.9991	0.0312
28.00	0.9869	0.0711	0.9975	0.0453	0.9966	0.0312
28.50	0.9868	0.0730	0.9968	0.0452	0.9947	0.0324
29.00	0.9880	0.0750	0.9964	0.0452	0.9940	0.0340
29.50	0.9903	0.0766	0.9965	0.0451	0.9944	0.0354
30.00	0.9934	0.0771	0.9965	0.0447	0.9952	0.0361
30.50	0.9965	0.0767	0.9962	0.0444	0.9959	0.0364
31.00	0.9994	0.0755	0.9957	0.0445	0.9966	0.0367
31.50	1.0021	0.0739	0.9957	0.0452	0.9976	0.0372
32.00	1.0047	0.0719	0.9965	0.0462	0.9992	0.0374
32.50	1.0075	0.0690	0.9982	0.0467	1.0012	0.0368
33.00	1.0096	0.0653	1.0004	0.0462	1.0030	0.0352
33.50	1.0107	0.0609	1.0024	0.0447	1.0040	0.0330
34.00	1.0104	0.0566	1.0037	0.0426	1.0040	0.0308
34.50	1.0090	0.0525	1.0042	0.0403	1.0035	0.0291
35.00	1.0070	0.0494	1.0043	0.0381	1.0026	0.0279
35.50	1.0047	0.0469	1.0037	0.0359	1.0023	0.0268
36.00	1.0022	0.0450	1.0036	0.0337	1.0017	0.0256
36.50	0.9994	0.0436	1.0014	0.0319	1.0006	0.0245
37.00	0.9964	0.0430	0.9991	0.0309	0.9991	0.0239
37.50	0.9934	0.0435	0.9968	0.0310	0.9975	0.0240
38.00	0.9909	0.0450	0.9950	0.0322	0.9964	0.0249
38.50	0.9895	0.0472	0.9943	0.0339	0.9960	0.0261
39.00	0.9891	0.0494	0.9946	0.0356	0.9964	0.0270
39.50	0.9894	0.0513	0.9956	0.0367	0.9969	0.0275
40.00	0.9903	0.0530	0.9967	0.0371	0.9974	0.0277
40.50	0.9915	0.0544	0.9982	0.0372	0.9979	0.0279
41.00	0.9932	0.0556	0.9995	0.0369	0.9986	0.0283
41.50	0.9954	0.0564	1.0009	0.0362	0.9997	0.0284
42.00	0.9981	0.0564	1.0021	0.0350	1.0011	0.0280
42.50	1.0007	0.0554	1.0028	0.0333	1.0023	0.0268
43.00	1.0036	0.0536	1.0026	0.0315	1.0028	0.0253
43.50	1.0045	0.0514	1.0022	0.0300	1.0028	0.0239
44.00	1.0054	0.0492	1.0012	0.0291	1.0024	0.0228
44.50	1.0059	0.0470	1.0005	0.0287	1.0020	0.0220
45.00	1.0062	0.0447	1.0000	0.0286	1.0016	0.0212
45.50	1.0060	0.0424	0.9998	0.0284	1.0011	0.0204
46.00	1.0052	0.0401	0.9996	0.0280	1.0003	0.0197
46.50	1.0039	0.0382	0.9993	0.0276	0.9991	0.0193
47.00	1.0022	0.0369	0.9986	0.0275	0.9980	0.0196
47.50	1.0005	0.0363	0.9985	0.0275	0.9973	0.0204
48.00	0.9991	0.0362	0.9983	0.0276	0.9972	0.0212
48.50	0.9980	0.0363	0.9983	0.0276	0.9975	0.0218
49.00	0.9970	0.0365	0.9983	0.0275	0.9979	0.0221
49.50	0.9962	0.0366	0.9981	0.0275	0.9982	0.0223
50.00	0.9955	0.0374	0.9979	0.0278	0.9985	0.0225

	MACH NUMBER 0.60 WIDTH TO LENGTH RATIO 0.0625		MACH NUMBER 0.60 WIDTH TO LENGTH RATIO 0.1250		MACH NUMBER 0.60 WIDTH TO LENGTH RATIO 0.2500	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.50	0.0057	0.0412	0.0075	0.0689	0.0150	0.1114
1.00	0.0136	0.0769	0.0272	0.1308	0.0542	0.2086
1.50	0.0264	0.1119	0.0528	0.1831	0.1052	0.2862
2.00	0.0399	0.1412	0.0796	0.2261	0.1578	0.3484
2.50	0.0534	0.1686	0.1064	0.2691	0.2109	0.4023
3.00	0.0678	0.1949	0.1350	0.3078	0.2650	0.4508
3.50	0.0837	0.2195	0.1663	0.3430	0.3246	0.4918
4.00	0.1005	0.2418	0.1994	0.3733	0.3866	0.5224
4.50	0.1174	0.2618	0.2325	0.3990	0.4474	0.5431
5.00	0.1340	0.2803	0.2647	0.4214	0.5050	0.5569
5.50	0.1505	0.2977	0.2966	0.4414	0.5606	0.5657
6.00	0.1672	0.3130	0.3287	0.4588	0.6149	0.5690
6.50	0.1838	0.3284	0.3604	0.4731	0.6669	0.5659
7.00	0.1999	0.3417	0.3908	0.4845	0.7145	0.5573
7.50	0.2154	0.3542	0.4196	0.4942	0.7569	0.5453
8.00	0.2304	0.3663	0.4472	0.5029	0.7953	0.5318
8.50	0.2454	0.3778	0.4743	0.5105	0.8309	0.5167
9.00	0.2602	0.3887	0.5008	0.5166	0.8635	0.4994
9.50	0.2747	0.3989	0.5262	0.5215	0.8922	0.4803
10.00	0.2887	0.4088	0.5506	0.5256	0.9169	0.4610
10.50	0.3026	0.4187	0.5743	0.5295	0.9389	0.4423
11.00	0.3167	0.4285	0.5980	0.5330	0.9592	0.4239
11.50	0.3310	0.4377	0.6216	0.5354	0.9780	0.4050
12.00	0.3454	0.4465	0.6449	0.5368	0.9946	0.3854
12.50	0.3598	0.4547	0.6676	0.5373	1.0087	0.3660
13.00	0.3742	0.4626	0.6901	0.5374	1.0212	0.3472
13.50	0.3888	0.4701	0.7126	0.5365	1.0328	0.3287
14.00	0.4034	0.4769	0.7350	0.5345	1.0432	0.3096
14.50	0.4180	0.4831	0.7568	0.5311	1.0517	0.2898
15.00	0.4323	0.4889	0.7777	0.5267	1.0578	0.2702
15.50	0.4467	0.4943	0.7980	0.5217	1.0622	0.2513
16.00	0.4611	0.4993	0.8178	0.5158	1.0652	0.2330
16.50	0.4754	0.5036	0.8370	0.5089	1.0667	0.2147
17.00	0.4895	0.5073	0.8552	0.5009	1.0662	0.1967
17.50	0.5032	0.5105	0.8721	0.4922	1.0635	0.1798
18.00	0.5166	0.5134	0.8878	0.4834	1.0591	0.1647
18.50	0.5298	0.5161	0.9028	0.4744	1.0538	0.1511
19.00	0.5427	0.5185	0.9171	0.4651	1.0477	0.1389
19.50	0.5554	0.5205	0.9305	0.4554	1.0406	0.1278
20.00	0.5677	0.5225	0.9431	0.4457	1.0325	0.1186
20.50	0.5799	0.5245	0.9549	0.4360	1.0241	0.1116
21.00	0.5921	0.5264	0.9662	0.4263	1.0161	0.1064
21.50	0.6043	0.5281	0.9770	0.4164	1.0087	0.1024
22.00	0.6166	0.5295	0.9872	0.4063	1.0016	0.0994
22.50	0.6288	0.5306	0.9968	0.3962	0.9949	0.0976
23.00	0.6409	0.5316	1.0058	0.3862	0.9887	0.0971
23.50	0.6531	0.5322	1.0146	0.3763	0.9837	0.0974
24.00	0.6653	0.5323	1.0231	0.3661	0.9797	0.0980
24.50	0.6773	0.5321	1.0311	0.3554	0.9762	0.0986
25.00	0.6890	0.5315	1.0385	0.3446	0.9731	0.0995
25.50	0.7005	0.5308	1.0452	0.3336	0.9706	0.1009
26.00	0.7118	0.5298	1.0514	0.3225	0.9688	0.1024
26.50	0.7231	0.5285	1.0570	0.3112	0.9677	0.1036
27.00	0.7341	0.5269	1.0617	0.2997	0.9666	0.1046
27.50	0.7447	0.5250	1.0656	0.2883	0.9655	0.1057
28.00	0.7551	0.5231	1.0686	0.2773	0.9645	0.1072
28.50	0.7653	0.5210	1.0712	0.2665	0.9641	0.1091
29.00	0.7754	0.5188	1.0732	0.2560	0.9643	0.1109
29.50	0.7853	0.5165	1.0747	0.2457	0.9647	0.1125
30.00	0.7949	0.5140	1.0756	0.2357	0.9652	0.1142
30.50	0.8045	0.5115	1.0760	0.2262	0.9660	0.1162
31.00	0.8139	0.5089	1.0762	0.2171	0.9675	0.1184
31.50	0.8233	0.5061	1.0761	0.2082	0.9697	0.1204
32.00	0.8325	0.5031	1.0757	0.1995	0.9724	0.1220
32.50	0.8416	0.4999	1.0748	0.1912	0.9753	0.1234
33.00	0.8504	0.4966	1.0737	0.1833	0.9787	0.1245
33.50	0.8592	0.4932	1.0724	0.1758	0.9827	0.1253
34.00	0.8679	0.4896	1.0711	0.1686	0.9872	0.1252
34.50	0.8763	0.4858	1.0697	0.1614	0.9917	0.1242
35.00	0.8846	0.4819	1.0680	0.1545	0.9958	0.1226
35.50	0.8926	0.4779	1.0660	0.1477	0.9997	0.1206
36.00	0.9005	0.4738	1.0639	0.1412	1.0036	0.1182
36.50	0.9084	0.4696	1.0617	0.1348	1.0073	0.1151
37.00	0.9160	0.4651	1.0591	0.1286	1.0105	0.1114
37.50	0.9234	0.4605	1.0561	0.1226	1.0130	0.1074
38.00	0.9306	0.4557	1.0523	0.1169	1.0148	0.1034
38.50	0.9375	0.4509	1.0493	0.1117	1.0163	0.0993
39.00	0.9443	0.4460	1.0457	0.1068	1.0173	0.0952
39.50	0.9508	0.4410	1.0418	0.1023	1.0178	0.0911
40.00	0.9570	0.4359	1.0377	0.0982	1.0176	0.0871
40.50	0.9629	0.4310	1.0334	0.0946	1.0171	0.0837
41.00	0.9688	0.4260	1.0292	0.0917	1.0165	0.0807
41.50	0.9746	0.4211	1.0252	0.0891	1.0160	0.0779
42.00	0.9802	0.4160	1.0213	0.0868	1.0153	0.0750
42.50	0.9856	0.4110	1.0175	0.0849	1.0144	0.0724
43.00	0.9909	0.4059	1.0137	0.0832	1.0133	0.0700
43.50	0.9961	0.4009	1.0105	0.0818	1.0124	0.0679
44.00	1.0013	0.3957	1.0073	0.0806	1.0115	0.0657
44.50	1.0063	0.3905	1.0042	0.0793	1.0105	0.0635
45.00	1.0111	0.3852	1.0010	0.0782	1.0092	0.0614
45.50	1.0158	0.3799	0.9977	0.0774	1.0077	0.0595
46.00	1.0203	0.3745	0.9947	0.0768	1.0062	0.0579
46.50	1.0247	0.3691	0.9919	0.0763	1.0048	0.0563
47.00	1.0290	0.3636	0.9891	0.0759	1.0032	0.0546
47.50	1.0330	0.3580	0.9862	0.0756	1.0012	0.0531
48.00	1.0369	0.3524	0.9834	0.0757	0.9989	0.0520
48.50	1.0406	0.3469	0.9807	0.0759	0.9966	0.0514
49.00	1.0441	0.3412	0.9782	0.0764	0.9944	0.0511
49.50	1.0475	0.3356	0.9757	0.0769	0.9922	0.0511
50.00	1.0507	0.3299	0.9733	0.0776	0.9900	0.0515

GENERALIZED FREQUENCY	MACH NUMBER 0.60 WIDTH TO LENGTH RATIO 0.5000		MACH NUMBER 0.60 WIDTH TO LENGTH RATIO 1.0000		MACH NUMBER 0.60 WIDTH TO LENGTH RATIO 2.0000	
	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.50	0.0399	0.1722	0.0594	0.2504	0.1190	0.3340
1.00	0.1076	0.3143	0.2042	0.4324	0.3668	0.5018
1.50	0.2064	0.4149	0.3831	0.5226	0.5041	0.4979
2.00	0.3050	0.4825	0.5349	0.5460	0.6929	0.4398
2.50	0.3985	0.5319	0.6542	0.5404	0.7430	0.4151
3.00	0.4926	0.5690	0.7548	0.5234	0.8005	0.4180
3.50	0.5901	0.5901	0.8451	0.4914	0.8751	0.4079
4.00	0.6858	0.5907	0.9178	0.4415	0.9418	0.3715
4.50	0.7718	0.5733	0.9642	0.3635	0.9846	0.3232
5.00	0.8448	0.5449	0.9881	0.3319	1.0073	0.2797
5.50	0.9071	0.5103	1.0016	0.2917	1.0220	0.2450
6.00	0.9608	0.4697	1.0123	0.2577	1.0348	0.2134
6.50	1.0040	0.4225	1.0186	0.2249	1.0427	0.1800
7.00	1.0338	0.3715	1.0175	0.1955	1.0409	0.1478
7.50	1.0500	0.3221	1.0114	0.1737	1.0314	0.1231
8.00	1.0563	0.2780	1.0060	0.1592	1.0202	0.1069
8.50	1.0563	0.2391	1.0035	0.1472	1.0107	0.0956
9.00	1.0508	0.2043	1.0011	0.1346	1.0013	0.0867
9.50	1.0393	0.1745	0.9955	0.1230	0.9909	0.0812
10.00	1.0232	0.1522	0.9879	0.1157	0.9812	0.0808
10.50	1.0061	0.1382	0.9817	0.1130	0.9752	0.0843
11.00	0.9910	0.1306	0.9783	0.1122	0.9738	0.0883
11.50	0.9785	0.1269	0.9764	0.1112	0.9748	0.0908
12.00	0.9676	0.1262	0.9745	0.1110	0.9759	0.0925
12.50	0.9587	0.1289	0.9735	0.1130	0.9779	0.0952
13.00	0.9534	0.1347	0.9756	0.1165	0.9827	0.0979
13.50	0.9528	0.1413	0.9813	0.1188	0.9901	0.0983
14.00	0.9559	0.1465	0.9887	0.1181	0.9975	0.0950
14.50	0.9608	0.1497	0.9956	0.1147	1.0027	0.0896
15.00	0.9664	0.1516	1.0014	0.1100	1.0058	0.0842
15.50	0.9733	0.1527	1.0067	0.1044	1.0086	0.0794
16.00	0.9817	0.1519	1.0115	0.0972	1.0116	0.0739
16.50	0.9903	0.1482	1.0143	0.0882	1.0134	0.0668
17.00	0.9975	0.1421	1.0139	0.0787	1.0125	0.0594
17.50	1.0026	0.1351	1.0106	0.0710	1.0094	0.0536
18.00	1.0064	0.1282	1.0062	0.0658	1.0058	0.0500
18.50	1.0095	0.1212	1.0017	0.0625	1.0028	0.0476
19.00	1.0115	0.1134	0.9978	0.0602	1.0001	0.0455
19.50	1.0117	0.1055	0.9936	0.0593	0.9967	0.0440
20.00	1.0100	0.0986	0.9898	0.0603	0.9931	0.0441
20.50	1.0076	0.0935	0.9878	0.0627	0.9905	0.0458
21.00	1.0054	0.0895	0.9880	0.0653	0.9896	0.0480
21.50	1.0034	0.0858	0.9896	0.0667	0.9899	0.0496
22.00	1.0010	0.0826	0.9913	0.0669	0.9905	0.0508
22.50	0.9982	0.0804	0.9927	0.0668	0.9914	0.0521
23.00	0.9958	0.0795	0.9948	0.0666	0.9932	0.0535
23.50	0.9945	0.0792	0.9972	0.0658	0.9961	0.0540
24.00	0.9939	0.0786	0.9994	0.0639	0.9992	0.0531
24.50	0.9933	0.0776	1.0006	0.0615	1.0016	0.0511
25.00	0.9925	0.0769	1.0011	0.0594	1.0032	0.0490
25.50	0.9921	0.0766	1.0016	0.0580	1.0046	0.0469
26.00	0.9923	0.0767	1.0026	0.0565	1.0061	0.0444
26.50	0.9930	0.0761	1.0037	0.0543	1.0069	0.0411
27.00	0.9933	0.0750	1.0041	0.0517	1.0064	0.0376
27.50	0.9931	0.0741	1.0038	0.0492	1.0049	0.0349
28.00	0.9931	0.0738	1.0033	0.0471	1.0031	0.0333
28.50	0.9936	0.0736	1.0028	0.0451	1.0016	0.0322
29.00	0.9945	0.0731	1.0018	0.0429	1.0002	0.0311
29.50	0.9952	0.0722	1.0001	0.0409	0.9983	0.0303
30.00	0.9956	0.0716	0.9975	0.0399	0.9962	0.0304
30.50	0.9962	0.0713	0.9953	0.0402	0.9947	0.0315
31.00	0.9975	0.0710	0.9936	0.0412	0.9941	0.0329
31.50	0.9991	0.0701	0.9931	0.0424	0.9943	0.0340
32.00	1.0006	0.0686	0.9923	0.0436	0.9947	0.0348
32.50	1.0016	0.0670	0.9931	0.0451	0.9951	0.0356
33.00	1.0026	0.0655	0.9942	0.0467	0.9961	0.0364
33.50	1.0038	0.0637	0.9964	0.0476	0.9977	0.0370
34.00	1.0049	0.0614	0.9990	0.0474	0.9995	0.0366
34.50	1.0054	0.0586	1.0012	0.0460	1.0011	0.0356
35.00	1.0050	0.0559	1.0027	0.0442	1.0021	0.0344
35.50	1.0043	0.0536	1.0038	0.0422	1.0030	0.0332
36.00	1.0035	0.0516	1.0044	0.0400	1.0038	0.0317
36.50	1.0024	0.0496	1.0045	0.0376	1.0043	0.0298
37.00	1.0007	0.0477	1.0038	0.0353	1.0041	0.0278
37.50	0.9986	0.0466	1.0023	0.0336	1.0032	0.0261
38.00	0.9966	0.0462	1.0009	0.0328	1.0021	0.0250
38.50	0.9949	0.0465	0.9996	0.0326	1.0011	0.0243
39.00	0.9936	0.0470	0.9988	0.0325	1.0002	0.0237
39.50	0.9924	0.0477	0.9981	0.0324	0.9990	0.0232
40.00	0.9914	0.0488	0.9973	0.0326	0.9976	0.0233
40.50	0.9911	0.0504	0.9969	0.0330	0.9966	0.0241
41.00	0.9916	0.0521	0.9970	0.0335	0.9962	0.0250
41.50	0.9928	0.0533	0.9973	0.0336	0.9963	0.0258
42.00	0.9942	0.0540	0.9975	0.0335	0.9965	0.0263
42.50	0.9958	0.0545	0.9974	0.0334	0.9967	0.0269
43.00	0.9976	0.0547	0.9973	0.0337	0.9973	0.0276
43.50	0.9998	0.0544	0.9979	0.0340	0.9983	0.0280
44.00	1.0021	0.0534	0.9986	0.0341	0.9997	0.0279
44.50	1.0040	0.0516	0.9994	0.0339	1.0008	0.0273
45.00	1.0052	0.0494	1.0000	0.0335	1.0015	0.0264
45.50	1.0060	0.0472	1.0007	0.0332	1.0020	0.0256
46.00	1.0065	0.0450	1.0017	0.0326	1.0026	0.0246
46.50	1.0066	0.0425	1.0027	0.0315	1.0029	0.0234
47.00	1.0060	0.0400	1.0031	0.0299	1.0029	0.0221
47.50	1.0048	0.0378	1.0030	0.0283	1.0024	0.0209
48.00	1.0031	0.0361	1.0024	0.0269	1.0016	0.0201
48.50	1.0013	0.0351	1.0016	0.0259	1.0009	0.0196
49.00	0.9996	0.0344	1.0007	0.0250	1.0002	0.0191
49.50	0.9977	0.0342	0.9994	0.0245	0.9993	0.0188
50.00	0.9959	0.0344	0.9986	0.0245	0.9983	0.0189

	Mach Number 0.70, Width to Length Ratio 0.0625		Mach Number 0.70, Width to Length Ratio 0.1250		Mach Number 0.70, Width to Length Ratio 0.2500	
Generalized Frequency	Radiation Resistance	Radiation Reactance	Radiation Resistance	Radiation Reactance	Radiation Resistance	Radiation Reactance
0.50	0.0045	0.0418	0.0091	0.0702	0.0183	0.1138
1.00	0.0153	0.0785	0.0307	0.1300	0.0612	0.2067
1.50	0.0274	0.1102	0.0540	0.1796	0.1089	0.2787
2.00	0.0394	0.1397	0.0787	0.2250	0.1558	0.3418
2.50	0.0529	0.1662	0.1054	0.2661	0.2077	0.3996
3.00	0.0681	0.1944	0.1354	0.3065	0.2654	0.4476
3.50	0.0837	0.2182	0.1663	0.3400	0.3237	0.4850
4.00	0.0995	0.2405	0.1972	0.3704	0.3813	0.5158
4.50	0.1160	0.2614	0.2295	0.3979	0.4403	0.5403
5.00	0.1330	0.2804	0.2626	0.4213	0.4996	0.5562
5.50	0.1498	0.2977	0.2951	0.4411	0.5560	0.5645
6.00	0.1663	0.3138	0.3267	0.4585	0.6093	0.5679
6.50	0.1829	0.3289	0.3583	0.4735	0.6609	0.5664
7.00	0.1994	0.3425	0.3893	0.4856	0.7094	0.5591
7.50	0.2152	0.3550	0.4187	0.4955	0.7530	0.5478
8.00	0.2305	0.3669	0.4470	0.5041	0.7927	0.5343
8.50	0.2457	0.3783	0.4748	0.5112	0.8294	0.5186
9.00	0.2607	0.3890	0.5014	0.5167	0.8623	0.5002
9.50	0.2752	0.3992	0.5268	0.5215	0.8906	0.4808
10.00	0.2896	0.4091	0.5514	0.5254	0.9159	0.4616
10.50	0.3039	0.4185	0.5757	0.5286	0.9388	0.4418
11.00	0.3179	0.4274	0.5992	0.5308	0.9587	0.4214
11.50	0.3316	0.4363	0.6219	0.5326	0.9755	0.4016
12.00	0.3454	0.4450	0.6443	0.5341	0.9908	0.3827
12.50	0.3596	0.4535	0.6669	0.5348	1.0047	0.3636
13.00	0.3738	0.4614	0.6890	0.5344	1.0164	0.3444
13.50	0.3881	0.4689	0.7107	0.5334	1.0263	0.3261
14.00	0.4026	0.4760	0.7322	0.5317	1.0354	0.3082
14.50	0.4172	0.4824	0.7534	0.5289	1.0433	0.2901
15.00	0.4316	0.4883	0.7741	0.5252	1.0494	0.2720
15.50	0.4458	0.4937	0.7943	0.5209	1.0540	0.2545
16.00	0.4601	0.4987	0.8143	0.5156	1.0576	0.2373
16.50	0.4742	0.5031	0.8337	0.5090	1.0597	0.2201
17.00	0.4881	0.5072	0.8519	0.5015	1.0598	0.2034
17.50	0.5020	0.5109	0.8692	0.4935	1.0587	0.1878
18.00	0.5159	0.5142	0.8858	0.4848	1.0565	0.1729
18.50	0.5295	0.5168	0.9013	0.4755	1.0527	0.1585
19.00	0.5427	0.5191	0.9158	0.4660	1.0472	0.1456
19.50	0.5557	0.5211	0.9296	0.4563	1.0410	0.1346
20.00	0.5684	0.5228	0.9427	0.4462	1.0344	0.1247
20.50	0.5809	0.5243	0.9547	0.4358	1.0270	0.1160
21.00	0.5930	0.5256	0.9658	0.4254	1.0189	0.1091
21.50	0.6051	0.5269	0.9762	0.4152	1.0109	0.1041
22.00	0.6170	0.5279	0.9861	0.4048	1.0033	0.1004
22.50	0.6287	0.5288	0.9951	0.3945	0.9958	0.0980
23.00	0.6403	0.5297	1.0036	0.3845	0.9890	0.0971
23.50	0.6521	0.5304	1.0118	0.3746	0.9832	0.0972
24.00	0.6638	0.5308	1.0198	0.3645	0.9782	0.0978
24.50	0.6755	0.5310	1.0273	0.3543	0.9737	0.0990
25.00	0.6872	0.5310	1.0344	0.3441	0.9701	0.1010
25.50	0.6989	0.5306	1.0410	0.3337	0.9677	0.1033
26.00	0.7105	0.5297	1.0471	0.3230	0.9661	0.1053
26.50	0.7219	0.5285	1.0525	0.3123	0.9650	0.1074
27.00	0.7330	0.5270	1.0574	0.3017	0.9646	0.1095
27.50	0.7439	0.5253	1.0619	0.2910	0.9649	0.1112
28.00	0.7545	0.5233	1.0658	0.2802	0.9652	0.1125
28.50	0.7648	0.5211	1.0689	0.2695	0.9657	0.1139
29.00	0.7750	0.5189	1.0715	0.2590	0.9666	0.1153
29.50	0.7851	0.5164	1.0736	0.2485	0.9679	0.1163
30.00	0.7949	0.5139	1.0749	0.2381	0.9691	0.1170
30.50	0.8044	0.5110	1.0757	0.2281	0.9703	0.1179
31.00	0.8138	0.5081	1.0760	0.2184	0.9719	0.1187
31.50	0.8230	0.5051	1.0758	0.2089	0.9736	0.1193
32.00	0.8319	0.5019	1.0747	0.1998	0.9753	0.1199
32.50	0.8407	0.4988	1.0736	0.1913	0.9772	0.1207
33.00	0.8494	0.4955	1.0722	0.1834	0.9797	0.1214
33.50	0.8580	0.4922	1.0706	0.1758	0.9825	0.1217
34.00	0.8664	0.4887	1.0688	0.1686	0.9854	0.1218
34.50	0.8747	0.4851	1.0669	0.1619	0.9887	0.1217
35.00	0.8829	0.4814	1.0651	0.1553	0.9922	0.1211
35.50	0.8910	0.4775	1.0631	0.1489	0.9958	0.1200
36.00	0.8988	0.4736	1.0603	0.1428	0.9993	0.1186
36.50	0.9066	0.4695	1.0585	0.1369	1.0029	0.1160
37.00	0.9143	0.4653	1.0560	0.1312	1.0066	0.1142
37.50	0.9218	0.4608	1.0534	0.1257	1.0099	0.1111
38.00	0.9291	0.4562	1.0505	0.1205	1.0127	0.1076
38.50	0.9363	0.4516	1.0476	0.1156	1.0153	0.1038
39.00	0.9432	0.4467	1.0446	0.1108	1.0174	0.0995
39.50	0.9499	0.4418	1.0413	0.1062	1.0187	0.0950
40.00	0.9564	0.4366	1.0373	0.1019	1.0193	0.0907
40.50	0.9628	0.4317	1.0342	0.0980	1.0196	0.0864
41.00	0.9689	0.4265	1.0305	0.0944	1.0194	0.0822
41.50	0.9746	0.4212	1.0266	0.0911	1.0185	0.0782
42.00	0.9805	0.4158	1.0226	0.0883	1.0174	0.0746
42.50	0.9859	0.4104	1.0186	0.0859	1.0160	0.0713
43.00	0.9911	0.4049	1.0146	0.0836	1.0143	0.0683
43.50	0.9960	0.3994	1.0108	0.0817	1.0122	0.0657
44.00	1.0007	0.3941	1.0068	0.0804	1.0101	0.0638
44.50	1.0052	0.3889	1.0031	0.0794	1.0082	0.0622
45.00	1.0096	0.3837	0.9996	0.0787	1.0063	0.0608
45.50	1.0140	0.3785	0.9962	0.0783	1.0045	0.0597
46.00	1.0182	0.3734	0.9930	0.0782	1.0029	0.0589
46.50	1.0225	0.3682	0.9902	0.0732	1.0015	0.0581
47.00	1.0265	0.3630	0.9876	0.0783	1.0000	0.0573
47.50	1.0305	0.3578	0.9851	0.0785	0.9985	0.0569
48.00	1.0344	0.3525	0.9823	0.0787	0.9973	0.0565
48.50	1.0383	0.3471	0.9807	0.0790	0.9962	0.0561
49.00	1.0419	0.3416	0.9783	0.0793	0.9949	0.0556
49.50	1.0454	0.3362	0.9764	0.0797	0.9936	0.0555
50.00	1.0487	0.3306	0.9744	0.0802	0.9925	0.0553

	MACH NUMBER 0.70 WIDTH TO LENGTH RATIO 0.5000		MACH NUMBER 0.70 WIDTH TO LENGTH RATIO 1.0000		MACH NUMBER 0.70 WIDTH TO LENGTH RATIO 2.0000	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.50	0.0364	0.1765	0.0721	0.2571	0.1386	0.3404
1.00	0.1211	0.3094	0.2323	0.4181	0.3966	0.4629
1.50	0.2126	0.3984	0.3876	0.4853	0.5588	0.4381
2.00	0.2991	0.4677	0.5121	0.5171	0.6320	0.4255
2.50	0.3914	0.5249	0.6286	0.5312	0.7077	0.4377
3.00	0.4900	0.5510	0.7373	0.5157	0.7907	0.4295
3.50	0.5837	0.5758	0.8198	0.4783	0.8544	0.4050
4.00	0.6696	0.5781	0.8789	0.4400	0.9103	0.3792
4.50	0.7520	0.5694	0.9286	0.4022	0.9591	0.3469
5.00	0.8283	0.5463	0.9676	0.3585	0.9954	0.3062
5.50	0.8922	0.5121	0.9901	0.3154	1.0162	0.2667
6.00	0.9442	0.4733	1.0036	0.2808	1.0299	0.2340
6.50	0.9877	0.4306	1.0153	0.2499	1.0414	0.2019
7.00	1.0205	0.3836	1.0217	0.2186	1.0450	0.1685
7.50	1.0406	0.3361	1.0207	0.1920	1.0394	0.1408
8.00	1.0509	0.2926	1.0181	0.1721	1.0317	0.1207
8.50	1.0547	0.2526	1.0161	0.1539	1.0236	0.1038
9.00	1.0511	0.2157	1.0108	0.1366	1.0126	0.0902
9.50	1.0405	0.1851	1.0023	0.1242	1.0003	0.0830
10.00	1.0270	0.1623	0.9951	0.1165	0.9911	0.0808
10.50	1.0129	0.1450	0.9890	0.1101	0.9846	0.0793
11.00	0.9975	0.1326	0.9817	0.1056	0.9779	0.0792
11.50	0.9821	0.1266	0.9749	0.1055	0.9727	0.0828
12.00	0.9696	0.1261	0.9716	0.1079	0.9719	0.0879
12.50	0.9607	0.1280	0.9708	0.1101	0.9739	0.0910
13.00	0.9540	0.1317	0.9710	0.1127	0.9763	0.0933
13.50	0.9502	0.1379	0.9736	0.1163	0.9801	0.0959
14.00	0.9509	0.1447	0.9795	0.1187	0.9862	0.0968
14.50	0.9548	0.1498	0.9865	0.1180	0.9923	0.0950
15.00	0.9601	0.1535	0.9930	0.1155	0.9973	0.0923
15.50	0.9671	0.1563	0.9995	0.1120	1.0024	0.0892
16.00	0.9762	0.1569	1.0060	0.1061	1.0076	0.0843
16.50	0.9855	0.1543	1.0103	0.0982	1.0110	0.0776
17.00	0.9935	0.1498	1.0118	0.0902	1.0122	0.0712
17.50	1.0010	0.1443	1.0121	0.0831	1.0127	0.0655
18.00	1.0078	0.1368	1.0114	0.0761	1.0125	0.0595
18.50	1.0125	0.1278	1.0087	0.0698	1.0105	0.0536
19.00	1.0148	0.1188	1.0048	0.0656	1.0073	0.0495
19.50	1.0159	0.1104	1.0015	0.0631	1.0044	0.0466
20.00	1.0157	0.1019	0.9987	0.0612	1.0013	0.0441
20.50	1.0134	0.0939	0.9956	0.0600	0.9975	0.0426
21.00	1.0097	0.0878	0.9931	0.0602	0.9939	0.0430
21.50	1.0062	0.0832	0.9917	0.0609	0.9919	0.0442
22.00	1.0023	0.0793	0.9915	0.0610	0.9905	0.0453
22.50	0.9979	0.0768	0.9906	0.0613	0.9892	0.0468
23.00	0.9938	0.0760	0.9904	0.0622	0.9891	0.0491
23.50	0.9910	0.0762	0.9912	0.0629	0.9903	0.0509
24.00	0.9887	0.0766	0.9921	0.0629	0.9919	0.0518
24.50	0.9869	0.0777	0.9928	0.0632	0.9936	0.0526
25.00	0.9861	0.0794	0.9943	0.0637	0.9961	0.0531
25.50	0.9867	0.0808	0.9965	0.0635	0.9991	0.0525
26.00	0.9877	0.0815	0.9986	0.0625	1.0014	0.0507
26.50	0.9888	0.0822	1.0005	0.0613	1.0032	0.0489
27.00	0.9908	0.0827	1.0027	0.0596	1.0050	0.0468
27.50	0.9932	0.0822	1.0049	0.0572	1.0064	0.0440
28.00	0.9953	0.0809	1.0061	0.0539	1.0067	0.0408
28.50	0.9969	0.0776	1.0066	0.0508	1.0063	0.0382
29.00	0.9988	0.0761	1.0063	0.0477	1.0058	0.0358
29.50	1.0005	0.0758	1.0054	0.0444	1.0047	0.0333
30.00	1.0014	0.0733	1.0035	0.0416	1.0028	0.0313
30.50	1.0019	0.0711	1.0011	0.0401	1.0008	0.0304
31.00	1.0024	0.0689	0.9989	0.0393	0.9992	0.0300
31.50	1.0025	0.0666	0.9966	0.0389	0.9976	0.0296
32.00	1.0021	0.0645	0.9947	0.0394	0.9958	0.0300
32.50	1.0016	0.0629	0.9934	0.0408	0.9946	0.0310
33.00	1.0013	0.0613	0.9932	0.0422	0.9942	0.0321
33.50	1.0008	0.0598	0.9934	0.0432	0.9940	0.0331
34.00	1.0003	0.0587	0.9939	0.0443	0.9941	0.0342
34.50	0.9995	0.0580	0.9951	0.0452	0.9949	0.0354
35.00	0.9994	0.0570	0.9967	0.0453	0.9963	0.0360
35.50	0.9989	0.0560	0.9980	0.0448	0.9975	0.0361
36.00	0.9984	0.0554	0.9991	0.0442	0.9980	0.0361
36.50	0.9982	0.0549	1.0004	0.0435	1.0004	0.0357
37.00	0.9981	0.0542	1.0014	0.0422	1.0020	0.0346
37.50	0.9978	0.0534	1.0019	0.0408	1.0029	0.0332
38.00	0.9975	0.0529	1.0023	0.0397	1.0036	0.0318
38.50	0.9973	0.0525	1.0027	0.0385	1.0042	0.0302
39.00	0.9972	0.0519	1.0030	0.0370	1.0043	0.0283
39.50	0.9968	0.0514	1.0028	0.0356	1.0038	0.0266
40.00	0.9965	0.0513	1.0025	0.0344	1.0030	0.0254
40.50	0.9966	0.0512	1.0022	0.0332	1.0023	0.0242
41.00	0.9966	0.0508	1.0016	0.0318	1.0011	0.0232
41.50	0.9964	0.0508	1.0004	0.0309	0.9997	0.0227
42.00	0.9966	0.0509	0.9993	0.0304	0.9986	0.0228
42.50	0.9971	0.0509	0.9983	0.0301	0.9977	0.0230
43.00	0.9976	0.0506	0.9971	0.0300	0.9968	0.0234
43.50	0.9981	0.0504	0.9960	0.0305	0.9961	0.0241
44.00	0.9989	0.0502	0.9955	0.0315	0.9960	0.0251
44.50	0.9998	0.0497	0.9954	0.0324	0.9962	0.0258
45.00	1.0005	0.0489	0.9956	0.0333	0.9965	0.0264
45.50	1.0011	0.0481	0.9962	0.0342	0.9970	0.0271
46.00	1.0019	0.0472	0.9974	0.0347	0.9980	0.0276
46.50	1.0025	0.0458	0.9988	0.0348	0.9991	0.0275
47.00	1.0027	0.0444	0.9999	0.0344	1.0001	0.0271
47.50	1.0027	0.0432	1.0011	0.0338	1.0010	0.0267
48.00	1.0026	0.0419	1.0022	0.0327	1.0019	0.0259
48.50	1.0023	0.0404	1.0026	0.0312	1.0025	0.0248
49.00	1.0015	0.0392	1.0027	0.0298	1.0027	0.0238
49.50	1.0007	0.0383	1.0027	0.0287	1.0028	0.0228
50.00	0.9998	0.0376	1.0024	0.0275	1.0029	0.0217

	MACH NUMBER 0.80 WIDTH TO LENGTH RATIO 0.0625		MACH NUMBER 0.80 WIDTH TO LENGTH RATIO 0.1250		MACH NUMBER 0.80 WIDTH TO LENGTH RATIO 0.2500	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.50	0.0059	0.0424	0.0119	0.0712	0.0238	0.1158
1.00	0.0167	0.0773	0.0334	0.1273	0.0666	0.2010
1.50	0.0273	0.1092	0.0545	0.1775	0.1082	0.2739
2.00	0.0400	0.1393	0.0797	0.2240	0.1575	0.3391
2.50	0.0534	0.1666	0.1063	0.2652	0.2090	0.3930
3.00	0.0677	0.1931	0.1346	0.3037	0.2630	0.4409
3.50	0.0832	0.2172	0.1650	0.3378	0.3203	0.4796
4.00	0.0908	0.2397	0.1950	0.3684	0.3772	0.5109
4.50	0.1153	0.2607	0.2279	0.3959	0.4356	0.5354
5.00	0.1320	0.2798	0.2601	0.4195	0.4929	0.5518
5.50	0.1486	0.2975	0.2924	0.4405	0.5486	0.5626
6.00	0.1654	0.3138	0.3247	0.4582	0.6031	0.5667
6.50	0.1819	0.3290	0.3560	0.4732	0.6539	0.5655
7.00	0.1986	0.3431	0.3872	0.4861	0.7024	0.5599
7.50	0.2148	0.3557	0.4173	0.4962	0.7471	0.5495
8.00	0.2305	0.3676	0.4461	0.5048	0.7878	0.5365
8.50	0.2459	0.3787	0.4741	0.5118	0.8252	0.5204
9.00	0.2608	0.3894	0.5010	0.5174	0.8582	0.5024
9.50	0.2756	0.3996	0.5272	0.5218	0.8879	0.4832
10.00	0.2901	0.4092	0.5522	0.5249	0.9138	0.4627
10.50	0.3045	0.4165	0.5761	0.5276	0.9364	0.4424
11.00	0.3188	0.4272	0.5995	0.5296	0.9565	0.4216
11.50	0.3325	0.4355	0.6222	0.5310	0.9732	0.4011
12.00	0.3462	0.4439	0.6447	0.5318	0.9880	0.3814
12.50	0.3600	0.4520	0.6666	0.5317	1.0008	0.3618
13.00	0.3738	0.4599	0.6878	0.5312	1.0116	0.3430
13.50	0.3879	0.4674	0.7090	0.5302	1.0210	0.3246
14.00	0.4020	0.4744	0.7296	0.5285	1.0288	0.3070
14.50	0.4162	0.4811	0.7503	0.5262	1.0357	0.2900
15.00	0.4305	0.4871	0.7707	0.5230	1.0414	0.2729
15.50	0.4447	0.4928	0.7907	0.5189	1.0457	0.2566
16.00	0.4589	0.4979	0.8103	0.5137	1.0491	0.2405
16.50	0.4730	0.5025	0.8289	0.5078	1.0512	0.2249
17.00	0.4870	0.5067	0.8472	0.5013	1.0525	0.2099
17.50	0.5008	0.5105	0.8646	0.4939	1.0524	0.1948
18.00	0.5145	0.5140	0.8817	0.4859	1.0510	0.1807
18.50	0.5283	0.5171	0.8980	0.4771	1.0486	0.1673
19.00	0.5419	0.5195	0.9131	0.4676	1.0448	0.1547
19.50	0.5553	0.5215	0.9274	0.4577	1.0404	0.1433
20.00	0.5682	0.5230	0.9407	0.4473	1.0349	0.1327
20.50	0.5808	0.5243	0.9529	0.4368	1.0285	0.1235
21.00	0.5932	0.5254	0.9643	0.4263	1.0216	0.1156
21.50	0.6052	0.5264	0.9748	0.4157	1.0141	0.1092
22.00	0.6171	0.5273	0.9847	0.4052	1.0068	0.1044
22.50	0.6289	0.5280	9.9940	0.3945	0.9995	0.1006
23.00	0.6405	0.5286	1.0025	0.3840	0.9923	0.0983
23.50	0.6520	0.5290	1.0104	0.3734	0.9856	0.0973
24.00	0.6634	0.5293	1.0176	0.3629	0.9794	0.0974
24.50	0.6749	0.5295	1.0243	0.3528	0.9742	0.0986
25.00	0.6863	0.5293	1.0307	0.3427	0.9677	0.1003
25.50	0.6976	0.5290	1.0367	0.3329	0.9564	0.1027
26.00	0.7084	0.5284	1.0425	0.3229	0.9640	0.1053
26.50	0.7200	0.5275	1.0479	0.3127	0.9623	0.1080
27.00	0.7310	0.5264	1.0527	0.3027	0.9615	0.1109
27.50	0.7420	0.5249	1.0572	0.2925	0.9616	0.1136
28.00	0.7527	0.5232	1.0612	0.2824	0.9623	0.1161
28.50	0.7633	0.5212	1.0648	0.2721	0.9638	0.1182
29.00	0.7736	0.5190	1.0677	0.2618	0.9653	0.1197
29.50	0.7837	0.5167	1.0701	0.2517	0.9672	0.1210
30.00	0.7937	0.5142	1.0720	0.2417	0.9694	0.1219
30.50	0.8036	0.5115	1.0735	0.2318	0.9717	0.1226
31.00	0.8133	0.5085	1.0742	0.2221	0.9742	0.1227
31.50	0.8228	0.5052	1.0745	0.2125	0.9765	0.1226
32.00	0.8319	0.5018	1.0743	0.2032	0.9788	0.1223
32.50	0.8408	0.4982	1.0736	0.1941	0.9810	0.1218
33.00	0.8494	0.4945	1.0722	0.1855	0.9831	0.1214
33.50	0.8577	0.4908	1.0706	0.1774	0.9855	0.1208
34.00	0.8658	0.4871	1.0685	0.1697	0.9877	0.1200
34.50	0.8737	0.4834	1.0663	0.1625	0.9900	0.1193
35.00	0.8814	0.4797	1.0639	0.1557	0.9924	0.1183
35.50	0.8891	0.4760	1.0613	0.1495	0.9949	0.1173
36.00	0.8967	0.4722	1.0589	0.1435	0.9975	0.1160
36.50	0.9043	0.4683	1.0562	0.1378	1.0000	0.1145
37.00	0.9117	0.4643	1.0534	0.1323	1.0028	0.1130
37.50	0.9191	0.4602	1.0506	0.1272	1.0056	0.1109
38.00	0.9263	0.4560	1.0476	0.1225	1.0083	0.1085
38.50	0.9334	0.4517	1.0447	0.1181	1.0109	0.1056
39.00	0.9405	0.4473	1.0418	0.1138	1.0131	0.1024
39.50	0.9474	0.4426	1.0389	0.1097	1.0151	0.0991
40.00	0.9542	0.4378	1.0360	0.1058	1.0169	0.0953
40.50	0.9608	0.4328	1.0328	0.1020	1.0181	0.0914
41.00	0.9671	0.4276	1.0296	0.0985	1.0190	0.0873
41.50	0.9732	0.4224	1.0263	0.0952	1.0192	0.0830
42.00	0.9791	0.4171	1.0229	0.0922	1.0189	0.0789
42.50	0.9848	0.4117	1.0195	0.0893	1.0181	0.0748
43.00	0.9902	0.4062	1.0158	0.0867	1.0168	0.0711
43.50	0.9954	0.4008	1.0121	0.0845	1.0152	0.0677
44.00	1.0004	0.3952	1.0084	0.0826	1.0132	0.0646
44.50	1.0051	0.3898	1.0046	0.0811	1.0109	0.0620
45.00	1.0097	0.3843	1.0009	0.0799	1.0084	[illegible]
45.50	1.0141	0.3788	0.9973	0.0791	1.0057	0.0582
46.00	1.0183	0.3734	0.9939	0.0787	1.0032	0.0570
46.50	1.0224	0.3679	0.9906	0.0785	1.0008	0.0562
47.00	1.0263	0.3626	0.9875	0.0785	0.9985	0.0559
47.50	1.0302	0.3572	0.9847	0.0787	0.9964	0.0558
48.00	1.0340	0.3517	0.9819	0.0792	0.9944	0.0560
48.50	1.0376	0.3462	0.9794	0.0798	0.9928	0.0566
49.00	1.0410	0.3406	0.9773	0.0805	0.9915	0.0571
49.50	1.0442	0.3350	0.9751	0.0814	0.9905	0.0578
50.00	1.0473	0.3295	0.9733	0.0824	0.9897	0.0585

	MACH NUMBER 0.80 WIDTH TO LENGTH RATIO 0.5000		MACH NUMBER 0.80 WIDTH TO LENGTH RATIO 1.0000		MACH NUMBER 0.80 WIDTH TO LENGTH RATIO 2.0000	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.50	0.0474	0.1797	0.0934	0.2505	0.1763	0.3372
1.00	0.1312	0.2965	0.2476	0.3874	0.3986	0.3984
1.50	0.2099	0.3871	0.3733	0.4607	0.5056	0.4158
2.00	0.3002	0.4601	0.5023	0.5018	0.6059	0.4308
2.50	0.3903	0.5095	0.6103	0.5065	0.6813	0.4327
3.00	0.4803	0.5464	0.7033	0.5016	0.7599	0.4361
3.50	0.5710	0.5647	0.7651	0.4778	0.8316	0.4162
4.00	0.6547	0.5693	0.8470	0.4407	0.8875	0.3930
4.50	0.7354	0.5623	0.9016	0.4158	0.9387	0.3626
5.00	0.8074	0.5421	0.9414	0.3774	0.9749	0.3267
5.50	0.8707	0.5150	0.9723	0.3428	1.0038	0.2937
6.00	0.9250	0.4792	0.9961	0.3057	1.0254	0.2570
6.50	0.9691	0.4390	1.0099	0.2724	1.0372	0.2236
7.00	1.0038	0.3965	1.0209	0.2418	1.0453	0.1914
7.50	1.0278	0.3518	1.0251	0.2124	1.0447	0.1612
8.00	1.0425	0.3095	1.0260	0.1884	1.0404	0.1376
8.50	1.0497	0.2697	1.0246	0.1654	1.0334	0.1164
9.00	1.0486	0.2322	1.0190	0.1467	1.0231	0.1011
9.50	1.0428	0.2010	1.0132	0.1315	1.0138	0.0897
10.00	1.0322	0.1743	1.0047	0.1163	1.0027	0.0814
10.50	1.0187	0.1546	0.9959	0.1104	0.9930	0.0781
11.00	1.0046	0.1398	0.9877	0.1045	0.9849	0.0764
11.50	0.9895	0.1307	0.9793	0.1026	0.9777	0.0780
12.00	0.9765	0.1268	0.9738	0.1033	0.9741	0.0811
12.50	0.9651	0.1261	0.9697	0.1052	0.9716	0.0843
13.00	0.9564	0.1295	0.9683	0.1093	0.9719	0.0886
13.50	0.9514	0.1342	0.9696	0.1125	0.9742	0.0916
14.00	0.9489	0.1403	0.9727	0.1156	0.9772	0.0944
14.50	0.9503	0.1460	0.9782	0.1174	0.9824	0.0961
15.00	0.9541	0.1519	0.9840	0.1170	0.9876	0.0958
15.50	0.9602	0.1564	0.9903	0.1157	0.9934	0.0949
16.00	0.9685	0.1585	0.9969	0.1119	0.9993	0.0917
16.50	0.9772	0.1585	1.0019	0.1070	1.0038	0.0878
17.00	0.9867	0.1564	1.0063	0.1012	1.0082	0.0829
17.50	0.9956	0.1518	1.0090	0.0944	1.0110	0.0769
18.00	1.0036	0.1456	1.0103	0.0882	1.0128	0.0713
18.50	1.0105	0.1375	1.0107	0.0817	1.0137	0.0649
19.00	1.0151	0.1285	1.0096	0.0761	1.0127	0.0591
19.50	1.0183	0.1191	1.0083	0.0713	1.0113	0.0540
20.00	1.0193	0.1092	1.0061	0.0668	1.0086	0.0494
20.50	1.0183	0.1002	1.0036	0.0638	1.0055	0.0463
21.00	1.0161	0.0919	1.0014	0.0610	1.0023	0.0437
21.50	1.0121	0.0849	0.9989	0.0591	0.9986	0.0424
22.00	1.0076	0.0795	0.9963	0.0580	0.9957	0.0422
22.50	1.0023	0.0754	0.9939	0.0577	0.9928	0.0424
23.00	0.9971	0.0733	0.9918	0.0574	0.9907	0.0438
23.50	0.9924	0.0724	0.9904	0.0579	0.9895	0.0453
24.00	0.9879	0.0728	0.9891	0.0589	0.9888	0.0472
24.50	0.9847	0.0745	0.9886	0.0604	0.9893	0.0492
25.00	0.9826	0.0765	0.9891	0.0616	0.9902	0.0506
25.50	0.9815	0.0792	0.9901	0.0631	0.9918	0.0520
26.00	0.9818	0.0817	0.9921	0.0640	0.9941	0.0526
26.50	0.9828	0.0841	0.9943	0.0644	0.9962	0.0527
27.00	0.9851	0.0861	0.9971	0.0642	0.9989	0.0522
27.50	0.9879	0.0870	0.9998	0.0630	1.0012	0.0508
28.00	0.9911	0.0874	1.0023	0.0612	1.0033	0.0492
28.50	0.9946	0.0868	1.0045	0.0586	1.0051	0.0468
29.00	0.9979	0.0853	1.0056	0.0556	1.0061	0.0442
29.50	1.0011	0.0832	1.0066	0.0525	1.0069	0.0415
30.00	1.0037	0.0801	1.0065	0.0491	1.0069	0.0386
30.50	1.0056	0.0769	1.0056	0.0463	1.0063	0.0361
31.00	1.0070	0.0732	1.0046	0.0438	1.0054	0.0337
31.50	1.0075	0.0694	1.0027	0.0418	1.0037	0.0318
32.00	1.0074	0.0659	1.0012	0.0406	1.0022	0.0305
32.50	1.0066	0.0624	0.9995	0.0396	1.0003	0.0294
33.00	1.0052	0.0596	0.9978	0.0395	0.9984	0.0292
33.50	1.0037	0.0572	0.9966	0.0395	0.9969	0.0293
34.00	1.0016	0.0553	0.9954	0.0398	0.9954	0.0298
34.50	0.9996	0.0542	0.9948	0.0404	0.9945	0.0308
35.00	0.9977	0.0534	0.9944	0.0409	0.9939	0.0317
35.50	0.9959	0.0533	0.9942	0.0416	0.9937	0.0330
36.00	0.9946	0.0535	0.9945	0.0423	0.9942	0.0340
36.50	0.9934	0.0540	0.9948	0.0428	0.9948	0.0350
37.00	0.9928	0.0549	0.9953	0.0434	0.9959	0.0358
37.50	0.9926	0.0557	0.9965	0.0436	0.9972	0.0360
38.00	0.9928	0.0565	0.9976	0.0438	0.9986	0.0361
38.50	0.9935	0.0571	0.9989	0.0436	1.0002	0.0356
39.00	0.9943	0.0575	1.0002	0.0430	1.0014	0.0348
39.50	0.9954	0.0577	1.0017	0.0422	1.0027	0.0337
40.00	0.9967	0.0575	1.0028	0.0407	1.0036	0.0322
40.50	0.9978	0.0571	1.0036	0.0392	1.0041	0.0307
41.00	0.9991	0.0563	1.0043	0.0374	1.0044	0.0290
41.50	1.0002	0.0552	1.0042	0.0354	1.0042	0.0274
42.00	1.0011	0.0540	1.0039	0.0337	1.0038	0.0259
42.50	1.0017	0.0525	1.0031	0.0320	1.0030	0.0245
43.00	1.0020	0.0511	1.0020	0.0306	1.0020	0.0235
43.50	1.0023	0.0497	1.0007	0.0299	1.0009	0.0228
44.00	1.0023	0.0482	0.9993	0.0294	0.9996	0.0224
44.50	1.0020	0.0469	0.9981	0.0295	0.9986	0.0224
45.00	1.0015	0.0456	0.9971	0.0297	0.9976	0.0226
45.50	1.0008	0.0447	0.9963	0.0303	0.9967	0.0231
46.00	1.0003	0.0440	0.9960	0.0310	0.9962	0.0237
46.50	0.9997	0.0433	0.9956	0.0317	0.9958	0.0245
47.00	0.9992	0.0429	0.9961	0.0323	0.9959	0.0254
47.50	0.9986	0.0424	0.9964	0.0328	0.9962	0.0261
48.00	0.9980	0.0423	0.9970	0.0332	0.9968	0.0268
48.50	0.9977	0.0424	0.9975	0.0334	0.9977	0.0272
49.00	0.9975	0.0424	0.9984	0.0332	0.9986	0.0273
49.50	0.9975	0.0424	0.9992	0.0332	0.9996	0.0272
50.00	0.9976	0.0423	1.0000	0.0328	1.0005	0.0268

	MACH NUMBER 0.90 WIDTH TO LENGTH RATIO 0.0625		MACH NUMBER 0.90 WIDTH TO LENGTH RATIO 0.1250		MACH NUMBER 0.90 WIDTH TO LENGTH RATIO 0.2500	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.50	0.0076	0.0419	0.0153	0.0701	0.0305	0.1133
1.00	0.0173	0.0767	0.0345	0.1262	0.0686	0.1982
1.50	0.0282	0.1086	0.0562	0.1760	0.1112	0.2702
2.00	0.0403	0.1380	0.0803	0.2213	0.1582	0.3327
2.50	0.0535	0.1659	0.1066	0.2628	0.2087	0.3871
3.00	0.0679	0.1918	0.1346	0.3007	0.2617	0.4338
3.50	0.0826	0.2159	0.1639	0.3350	0.3166	0.4729
4.00	0.0982	0.2388	0.1944	0.3660	0.3726	0.5047
4.50	0.1145	0.2597	0.2259	0.3933	0.4291	0.5291
5.00	0.1310	0.2789	0.2577	0.4176	0.4855	0.5471
5.50	0.1475	0.2969	0.2899	0.4390	0.5406	0.5586
6.00	0.1642	0.3138	0.3220	0.4570	0.5940	0.5644
6.50	0.1811	0.3290	0.3534	0.4725	0.6451	0.5644
7.00	0.1977	0.3429	0.3844	0.4857	0.6932	0.5598
7.50	0.2139	0.3558	0.4149	0.4965	0.7385	0.5509
8.00	0.2298	0.3680	0.4443	0.5050	0.7800	0.5385
8.50	0.2454	0.3794	0.4724	0.5120	0.8178	0.5234
9.00	0.2608	0.3900	0.4998	0.5178	0.8519	0.5058
9.50	0.2760	0.4000	0.5263	0.5219	0.8823	0.4865
10.00	0.2909	0.4092	0.5516	0.5249	0.9090	0.4663
10.50	0.3050	0.4180	0.5759	0.5270	0.9326	0.4455
11.00	0.3189	0.4267	0.5992	0.5286	0.9527	0.4243
11.50	0.3328	0.4352	0.6220	0.5295	0.9699	0.4035
12.00	0.3468	0.4434	0.6442	0.5298	0.9848	0.3829
12.50	0.3607	0.4511	0.6658	0.5293	0.9973	0.3629
13.00	0.3745	0.4585	0.6866	0.5284	1.0077	0.3437
13.50	0.3882	0.4656	0.7070	0.5273	1.0164	0.3253
14.00	0.4019	0.4724	0.7274	0.5255	1.0239	0.3075
14.50	0.4155	0.4790	0.7475	0.5230	1.0299	0.2903
15.00	0.4294	0.4853	0.7671	0.5198	1.0347	0.2741
15.50	0.4434	0.4912	0.7863	0.5160	1.0387	0.2585
16.00	0.4573	0.4966	0.8052	0.5116	1.0417	0.2433
16.50	0.4714	0.5016	0.8237	0.5064	1.0437	0.2286
17.00	0.4856	0.5061	0.8418	0.5005	1.0449	0.2146
17.50	0.4996	0.5099	0.8595	0.4937	1.0453	0.2009
18.00	0.5134	0.5132	0.8765	0.4861	1.0446	0.1878
18.50	0.5269	0.5162	0.8926	0.4778	1.0431	0.1752
19.00	0.5403	0.5189	0.9080	0.4689	1.0405	0.1633
19.50	0.5536	0.5212	0.9226	0.4596	1.0372	0.1522
20.00	0.5668	0.5232	0.9365	0.4498	1.0331	0.1417
20.50	0.5798	0.5247	0.9495	0.4395	1.0281	0.1323
21.00	0.5925	0.5257	0.9615	0.4287	1.0224	0.1240
21.50	0.6046	0.5265	0.9724	0.4178	1.0163	0.1168
22.00	0.6169	0.5271	0.9826	0.4070	1.0098	0.1107
22.50	0.6288	0.5275	0.9920	0.3961	1.0029	0.1060
23.00	0.6404	0.5277	1.0006	0.3852	0.9961	0.1025
23.50	0.6517	0.5279	1.0086	0.3744	0.9894	0.1003
24.00	0.6630	[illegible]	1.0155	0.3637	0.9831	0.0991
24.50	0.6741	0.5279	1.0224	0.3531	0.9772	0.0991
25.00	0.6852	0.5277	1.0285	0.3427	0.9721	0.1002
25.50	0.6962	0.5273	1.0341	0.3326	0.9677	0.1019
26.00	0.7072	0.5267	1.0393	0.3226	0.9641	0.1043
26.50	0.7180	0.5260	1.0441	0.3127	0.9616	0.1072
27.00	0.7288	0.5251	1.0487	0.3030	0.9599	0.1102
27.50	0.7395	0.5239	1.0528	0.2932	0.9592	0.1135
28.00	0.7502	0.5225	1.0566	0.2835	0.9593	0.1167
28.50	0.7607	0.5208	1.0600	0.2738	0.9603	0.1195
29.00	0.7710	0.5190	1.0629	0.2642	0.9618	0.1221
29.50	0.7813	0.5169	1.0655	0.2547	0.9641	0.1243
30.00	0.7914	0.5147	1.0673	0.2452	0.9668	0.1260
30.50	0.8015	0.5122	1.0697	0.2357	0.9699	0.1271
31.00	0.8115	0.5096	1.0710	0.2262	0.9730	0.1276
31.50	0.8213	0.5062	1.0718	0.2167	0.9761	0.1277
32.00	0.8307	0.5027	1.0720	0.2075	0.9794	0.1274
32.50	0.8398	0.4991	1.0717	0.1986	0.9826	0.1266
33.00	0.8487	0.4953	1.0711	0.1900	0.9857	0.1254
33.50	0.8573	0.4914	1.0701	0.1815	0.9884	0.1238
34.00	0.8656	0.4875	1.0686	0.1733	0.9909	0.1221
34.50	0.8737	0.4835	1.0666	0.1656	0.9933	0.1204
35.00	0.8816	0.4795	1.0643	0.1583	0.9955	0.1185
35.50	0.8893	0.4754	1.0617	0.1514	0.9975	0.1166
36.00	0.8969	0.4712	1.0588	0.1450	0.9995	0.1146
36.50	0.9042	0.4668	1.0559	0.1391	1.0013	0.1124
37.00	0.9113	0.4625	1.0526	0.1335	1.0026	0.1103
37.50	0.9182	0.4582	1.0496	0.1284	1.0044	0.1083
38.00	0.9251	0.4539	1.0464	0.1236	1.0061	0.1063
38.50	0.9318	0.4495	1.0432	0.1192	1.0079	0.1041
39.00	0.9384	0.4450	1.0400	0.1151	1.0095	0.1016
39.50	0.9449	0.4404	1.0369	0.1113	1.0110	0.0989
40.00	0.9511	0.4358	1.0337	0.1078	1.0123	0.0962
40.50	0.9573	0.4312	1.0306	0.1045	1.0135	0.0934
41.00	0.9634	0.4265	1.0275	0.1014	1.0145	0.0904
41.50	0.9693	0.4217	1.0245	0.0985	1.0155	0.0871
42.00	0.9752	0.4168	1.0215	0.0956	1.0160	0.0837
42.50	0.9808	0.4118	1.0184	0.0930	1.0162	0.0801
43.00	0.9863	0.4067	1.0152	0.0906	1.0159	0.0766
43.50	0.9916	0.4015	1.0120	0.0884	1.0152	0.0731
44.00	0.9968	0.3963	1.0088	0.0863	1.0142	0.0698
44.50	1.0017	0.3910	1.0055	0.0845	1.0128	0.0666
45.00	1.0064	0.3857	1.0022	0.0829	1.0110	0.0638
45.50	1.0110	0.3803	0.9989	0.0816	1.0090	0.0612
46.00	1.0154	0.3749	0.9955	0.0805	1.0066	0.0590
46.50	1.0196	0.3696	0.9922	0.0797	1.0040	0.0571
47.00	1.0236	0.3642	0.9888	0.0792	1.0013	0.0559
47.50	1.0274	0.3589	0.9855	0.0792	0.9986	0.0551
48.00	1.0311	0.3536	0.9824	0.0794	0.9961	0.0548
48.50	1.0347	0.3485	0.9795	0.0799	0.9937	0.0549
49.00	1.0383	0.3433	0.9766	0.0807	0.9915	0.0553
49.50	1.0418	0.3380	0.9744	0.0816	0.9896	0.0560
50.00	1.0452	0.3327	0.9722	0.0826	0.9879	0.0571

GENERALIZED FREQUENCY	MACH NUMBER 0.90 WIDTH TO LENGTH RATIO 0.5000 RADIATION RESISTANCE	RADIATION REACTANCE	MACH NUMBER 0.90 WIDTH TO LENGTH RATIO 1.0000 RADIATION RESISTANCE	RADIATION REACTANCE	MACH NUMBER 0.90 WIDTH TO LENGTH RATIO 2.0000 RADIATION RESISTANCE	RADIATION REACTANCE
0.50	0.0606	0.1736	0.1179	0.2442	0.2119	0.2927
1.00	0.1342	0.2889	0.2467	0.3675	0.3685	0.3674
1.50	0.2137	0.3771	0.3683	0.4302	0.4753	0.4041
2.00	0.2979	0.4449	0.4805	0.4762	0.5682	0.4279
2.50	0.3844	0.4958	0.5822	0.4925	0.6547	0.4391
3.00	0.4709	0.5313	0.6724	0.4929	0.7330	0.4392
3.50	0.5556	0.5524	0.7506	0.4807	0.8040	0.4282
4.00	0.6370	0.5599	0.8171	0.4556	0.8641	0.4074
4.50	0.7138	0.5554	0.8726	0.4298	0.9144	0.3801
5.00	0.7847	0.5406	0.9182	0.3975	0.9563	0.3492
5.50	0.8481	0.5172	0.9542	0.3640	0.9898	0.3162
6.00	0.9029	0.4865	0.9818	0.3304	1.0149	0.2822
6.50	0.9489	0.4503	1.0021	0.2973	1.0321	0.2480
7.00	0.9856	0.4106	1.0165	0.2653	1.0423	0.2148
7.50	1.0134	0.3691	1.0258	0.2351	1.0466	0.1844
8.00	1.0322	0.3279	1.0304	0.2075	1.0461	0.1575
8.50	1.0427	0.2880	1.0307	0.1825	1.0415	0.1345
9.00	1.0460	0.2511	1.0275	0.1603	1.0339	0.1152
9.50	1.0432	0.2180	1.0216	0.1414	1.0245	0.0998
10.00	1.0357	0.1899	1.0138	0.1262	1.0143	0.0885
10.50	1.0248	0.1671	1.0048	0.1148	1.0040	0.0812
11.00	1.0115	0.1498	0.9954	0.1071	0.9943	0.0773
11.50	0.9976	0.1376	0.9864	0.1028	0.9858	0.0760
12.00	0.9840	0.1304	0.9788	0.1013	0.9791	0.0768
12.50	0.9719	0.1276	0.9732	0.1023	0.9744	0.0792
13.00	0.9618	0.1283	0.9697	0.1048	0.9717	0.0826
13.50	0.9544	0.1318	0.9684	0.1081	0.9709	0.0867
14.00	0.9501	0.1368	0.9692	0.1114	0.9720	0.0905
14.50	0.9487	0.1427	0.9720	0.1140	0.9748	0.0935
15.00	0.9506	0.1487	0.9763	0.1156	0.9790	0.0956
15.50	0.9548	0.1539	0.9815	0.1160	0.9840	0.0966
16.00	0.9613	0.1577	0.9870	0.1149	0.9894	0.0963
16.50	0.9692	0.1596	0.9924	0.1125	0.9949	0.0946
17.00	0.9782	0.1594	0.9974	0.1089	1.0002	0.0916
17.50	0.9875	0.1570	1.0019	0.1045	1.0050	0.0875
18.00	0.9964	0.1526	1.0054	0.0994	1.0089	0.0826
18.50	1.0043	0.1463	1.0081	0.0939	1.0117	0.0771
19.00	1.0110	0.1383	1.0097	0.0882	1.0133	0.0712
19.50	1.0160	0.1293	1.0105	0.0825	1.0139	0.0652
20.00	1.0191	0.1197	1.0105	0.0771	1.0134	0.0596
20.50	1.0203	0.1100	1.0097	0.0720	1.0119	0.0545
21.00	1.0196	0.1007	1.0081	0.0674	1.0095	0.0501
21.50	1.0172	0.0922	1.0059	0.0633	1.0066	0.0466
22.00	1.0134	0.0849	1.0034	0.0600	1.0033	0.0440
22.50	1.0087	0.0790	1.0004	0.0575	1.0000	0.0424
23.00	1.0033	0.0747	0.9974	0.0559	0.9968	0.0418
23.50	0.9977	0.0721	0.9945	0.0553	0.9939	0.0420
24.00	0.9924	0.0711	0.9918	0.0554	0.9915	0.0428
24.50	0.9877	0.0713	0.9896	0.0562	0.9898	0.0442
25.00	0.9857	0.0728	0.9883	0.0577	0.9889	0.0459
25.50	0.9869	0.0754	0.9878	0.0594	0.9886	0.0478
26.00	0.9794	0.0773	0.9880	0.0612	0.9891	0.0496
26.50	0.9790	0.0814	0.9891	0.0626	0.9903	0.0511
27.00	0.9799	0.0845	0.9908	0.0637	0.9920	0.0523
27.50	0.9820	0.0872	0.9931	0.0643	0.9941	0.0529
28.00	0.9849	0.0890	0.9956	0.0641	0.9965	0.0529
28.50	0.9884	0.0900	0.9980	0.0634	0.9989	0.0524
29.00	0.9923	0.0902	1.0003	0.0619	1.0012	0.0512
29.50	0.9965	0.0892	1.0024	0.0599	1.0033	0.0494
30.00	1.0004	0.0872	1.0040	0.0576	1.0050	0.0473
30.50	1.0038	0.0845	1.0051	0.0551	1.0063	0.0449
31.00	1.0067	0.0810	1.0057	0.0525	1.0070	0.0423
31.50	1.0088	0.0770	1.0059	0.0498	1.0071	0.0395
32.00	1.0101	0.0726	1.0056	0.0473	1.0068	0.0369
32.50	1.0104	0.0681	1.0050	0.0450	1.0059	0.0345
33.00	1.0099	0.0640	1.0039	0.0429	1.0047	0.0325
33.50	1.0087	0.0601	1.0027	0.0413	1.0031	0.0309
34.00	1.0068	0.0567	1.0015	0.0399	1.0014	0.0297
34.50	1.0043	0.0540	0.9997	0.0389	0.9996	0.0291
35.00	1.0016	0.0522	0.9982	0.0384	0.9979	0.0289
35.50	0.9989	0.0510	0.9967	0.0382	0.9964	0.0293
36.00	0.9962	0.0505	0.9954	0.0384	0.9951	0.0298
36.50	0.9937	0.0508	0.9943	0.0390	0.9942	0.0308
37.00	0.9917	0.0517	0.9936	0.0399	0.9937	0.0318
37.50	0.9903	0.0530	0.9933	0.0409	0.9936	0.0330
38.00	0.9894	0.0545	0.9934	0.0420	0.9939	0.0341
38.50	0.9891	0.0562	0.9940	0.0430	0.9946	0.0350
39.00	0.9895	0.0579	0.9950	0.0436	0.9957	0.0358
39.50	0.9905	0.0593	0.9962	0.0441	0.9969	0.0361
40.00	0.9920	0.0604	0.9978	0.0442	0.9983	0.0362
40.50	0.9937	0.0611	0.9992	0.0437	0.9997	0.0359
41.00	0.9957	0.0613	1.0006	0.0430	1.0011	0.0353
41.50	0.9979	0.0609	1.0020	0.0419	1.0023	0.0342
42.00	1.0000	0.0600	1.0029	0.0404	1.0033	0.0330
42.50	1.0019	0.0586	1.0036	0.0389	1.0041	0.0314
43.00	1.0035	0.0569	1.0040	0.0373	1.0044	0.0299
43.50	1.0047	0.0546	1.0039	0.0356	1.0045	0.0283
44.00	1.0056	0.0525	1.0036	0.0341	1.0042	0.0268
44.50	1.0059	0.0501	1.0031	0.0327	1.0037	0.0254
45.00	1.0057	0.0477	1.0024	0.0316	1.0029	0.0242
45.50	1.0051	0.0456	1.0015	0.0306	1.0019	0.0232
46.00	1.0042	0.0437	1.0005	0.0300	1.0007	0.0225
46.50	1.0029	0.0420	0.9996	0.0295	0.9995	0.0222
47.00	1.0015	0.0408	0.9985	0.0293	0.9984	0.0222
47.50	0.9999	0.0400	0.9977	0.0293	0.9975	0.0226
48.00	0.9983	0.0395	0.9969	0.0296	0.9967	0.0230
48.50	0.9968	0.0396	0.9963	0.0300	0.9962	0.0237
49.00	0.9956	0.0400	0.9958	0.0306	0.9959	0.0243
49.50	0.9947	0.0406	0.9957	0.0313	0.9958	0.0252
50.00	0.9940	0.0414	0.9957	0.0319	0.9960	0.0259

GENERALIZED FREQUENCY	MACH NUMBER 0.95 WIDTH TO LENGTH RATIO 0.0625		MACH NUMBER 0.95 WIDTH TO LENGTH RATIO 0.1250		MACH NUMBER 0.95 WIDTH TO LENGTH RATIO 0.2500	
	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.50	0.0077	0.0418	0.0157	0.0699	0.0318	0.1125
1.00	0.0176	0.0764	0.0351	0.1253	0.0699	0.1960
1.50	0.0265	0.1081	0.0569	0.1749	0.1125	0.2674
2.00	0.0406	0.1375	0.0806	0.2201	0.1586	0.3296
2.50	0.0536	0.1653	0.1067	0.2615	0.2082	0.3835
3.00	0.0679	0.1912	0.1342	0.2991	0.2603	0.4300
3.50	0.0824	0.2153	0.1634	0.3334	0.3142	0.4690
4.00	0.0980	0.2381	0.1937	0.3642	0.3695	0.5008
4.50	0.1141	0.2590	0.2247	0.3920	0.4252	0.5260
5.00	0.1304	0.2785	0.2565	0.4162	0.4808	0.5442
5.50	0.1469	0.2966	0.2883	0.4376	0.5354	0.5566
6.00	0.1637	0.3135	0.3202	0.4562	0.5883	0.5628
6.50	0.1806	0.3287	0.3518	0.4719	0.6394	0.5639
7.00	0.1970	0.3427	0.3827	0.4850	0.6876	0.5600
7.50	0.2132	0.3560	0.4130	0.4962	0.7328	0.5520
8.00	0.2294	0.3682	0.4427	0.5050	0.7748	0.5402
8.50	0.2453	0.3795	0.4710	0.5120	0.8129	0.5255
9.00	0.2607	0.3899	0.4986	0.5177	0.8478	0.5084
9.50	0.2758	0.3998	0.5251	0.5219	0.8786	0.4894
10.00	0.2904	0.4091	0.5506	0.5249	0.9060	0.4693
10.50	0.3048	0.4182	0.5750	0.5270	0.9300	0.4483
11.00	0.3192	0.4268	0.5985	0.5283	0.9506	0.4270
11.50	0.3333	0.4349	0.6213	0.5291	0.9683	0.4058
12.00	0.3471	0.4426	0.6434	0.5289	0.9832	0.3849
12.50	0.3606	0.4502	0.6646	0.5285	0.9950	0.3646
13.00	0.3742	0.4578	0.6855	0.5277	1.0063	0.3449
13.50	0.3879	0.4650	0.7060	0.5262	1.0148	0.3262
14.00	0.4016	0.4715	0.7260	0.5241	1.0220	0.3082
14.50	0.4153	0.4783	0.7456	0.5217	1.0277	0.2911
15.00	0.4291	0.4844	0.7650	0.5186	1.0323	0.2748
15.50	0.4428	0.4902	0.7840	0.5150	1.0358	0.2593
16.00	0.4566	0.4957	0.8028	0.5107	1.0385	0.2444
16.50	0.4705	0.5008	0.8210	0.5056	1.0403	0.2301
17.00	0.4844	0.5053	0.8389	0.4999	1.0413	0.2164
17.50	0.4983	0.5095	0.8563	0.4935	1.0416	0.2033
18.00	0.5122	0.5132	0.8732	0.4864	1.0411	0.1908
18.50	0.5261	0.5165	0.8896	0.4784	1.0398	0.1787
19.00	0.5396	0.5188	0.9051	0.4698	1.0377	0.1672
19.50	0.5529	0.5211	0.9196	0.4607	1.0348	0.1565
20.00	0.5661	0.5230	0.9339	0.4512	1.0313	0.1463
20.50	0.5791	0.5246	0.9471	0.4409	1.0269	0.1370
21.00	0.5919	0.5258	0.9593	0.4304	1.0219	0.1287
21.50	0.6045	0.5265	0.9706	0.4197	1.0164	0.1214
22.00	0.6167	0.5270	0.9811	0.4088	1.0106	0.1151
22.50	0.6286	0.5272	0.9908	0.3977	1.0042	0.1097
23.00	0.6402	0.5274	0.9996	0.3867	0.9977	0.1058
23.50	0.6517	0.5274	1.0076	0.3757	0.9913	0.1031
24.00	0.6630	0.5272	1.0156	0.3648	0.9853	0.1013
24.50	0.6751	0.5269	1.0216	0.3550	0.9793	0.1005
25.00	0.6869	0.5265	1.0277	0.3456	0.9739	0.1010
25.50	0.6959	0.5259	1.0335	0.3332	0.9693	0.1023
26.00	0.7064	0.5252	1.0383	0.3230	0.9654	0.1042
26.50	0.7170	0.5244	1.0430	0.3131	0.9623	0.1067
27.00	0.7275	0.5235	1.0473	0.3032	0.9601	0.1097
27.50	0.7379	0.5226	1.0517	0.2735	0.9588	0.1130
28.00	0.7482	0.5217	1.0550	0.2840	0.9585	0.1163
28.50	0.7585	0.5198	1.0581	0.2745	0.9591	0.1194
29.00	0.7687	0.5181	1.0610	0.2651	0.9604	0.1223
29.50	0.7789	0.5163	1.0635	0.2557	0.9623	0.1249
30.00	0.7890	0.5143	1.0650	0.2464	0.9649	0.1271
30.50	0.7990	0.5119	1.0677	0.2371	0.9680	0.1286
31.00	0.8098	0.5093	1.0692	0.2278	0.9714	0.1296
31.50	0.8183	0.5064	1.0700	0.2186	0.9749	0.1300
32.00	0.8277	0.5035	1.0705	0.2096	0.9785	0.1298
32.50	0.8370	0.5003	1.0706	0.2008	0.9821	0.1292
33.00	0.8461	0.4970	1.0702	0.1920	0.9856	0.1281
33.50	0.8551	0.4935	1.0694	0.1835	0.9888	0.1264
34.00	0.8636	0.4897	1.0681	0.1753	0.9918	0.1245
34.50	0.8722	0.4857	1.0663	0.1674	0.9945	0.1224
35.00	0.8804	0.4817	1.0641	0.1599	0.9969	0.1201
35.50	0.8884	0.4776	1.0616	0.1527	0.9991	0.1176
36.00	0.8961	0.4734	1.0587	0.1462	1.0010	0.1151
36.50	0.9037	0.4691	1.0557	0.1400	1.0026	0.1126
37.00	0.9111	0.4649	1.0525	0.1343	1.0041	0.1101
37.50	0.9185	0.4606	1.0493	0.1290	1.0054	0.1077
38.00	0.9256	0.4559	1.0459	0.1241	1.0067	0.1053
38.50	0.9325	0.4513	1.0423	0.1196	1.0078	0.1028
39.00	0.9393	0.4466	1.0388	0.1156	1.0088	0.1004
39.50	0.9459	0.4417	1.0354	0.1120	1.0098	0.0980
40.00	0.9526	0.4371	1.0321	0.1088	1.0107	0.0956
40.50	0.9588	0.4322	1.0289	0.1058	1.0116	0.0930
41.00	0.9650	0.4272	1.0259	0.1029	1.0125	0.0904
41.50	0.9710	0.4220	1.0229	0.1002	1.0130	0.0875
42.00	0.9769	0.4167	1.0199	0.0977	1.0135	0.0848
42.50	0.9825	0.4116	1.0169	0.0954	1.0138	0.0818
43.00	0.9881	0.4062	1.0140	0.0934	1.0139	0.0788
43.50	0.9934	0.4007	1.0112	0.0914	1.0136	0.0757
44.00	0.9984	0.3951	1.0084	0.0896	1.0130	0.0726
44.50	1.0032	0.3894	1.0056	0.0878	1.0121	0.0697
45.00	1.0078	0.3838	1.0028	0.0862	1.0109	0.0668
45.50	1.0122	0.3781	0.9999	0.0846	1.0093	0.0642
46.00	1.0163	0.3725	0.9970	0.0834	1.0075	0.0618
46.50	1.0202	0.3668	0.9940	0.0823	1.0054	0.0597
47.00	1.0239	0.3612	0.9910	0.0814	1.0031	0.0579
47.50	1.0274	0.3557	0.9881	0.0808	1.0006	0.0566
48.00	1.0307	0.3501	0.9851	0.0805	0.9981	0.0558
48.50	1.0338	0.3447	0.9822	0.0804	0.9956	0.0553
49.00	1.0368	0.3394	0.9794	0.0806	0.9932	0.0552
49.50	1.0396	0.3341	0.9768	0.0810	0.9910	0.0556
50.00	1.0424	0.3289	0.9743	0.0815	0.9890	0.0563

	MACH NUMBER 0.95 WIDTH TO LENGTH RATIO 0.5000		MACH NUMBER 0.95 WIDTH TO LENGTH RATIO 1.0000		MACH NUMBER 0.95 WIDTH TO LENGTH RATIO 2.0000	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.50	0.0629	0.1713	0.1207	0.2371	0.2072	0.2748
1.00	0.1359	0.2832	0.2444	0.3530	0.3487	0.3534
1.50	0.2144	0.3701	0.3609	0.4256	0.4596	0.4003
2.00	0.2959	0.4376	0.4681	0.4684	0.5540	0.4290
2.50	0.3795	0.4884	0.5672	0.4880	0.6405	0.4428
3.00	0.4634	0.5246	0.6563	0.4923	0.7198	0.4441
3.50	0.5462	0.5467	0.7348	0.4822	0.7900	0.4337
4.00	0.6264	0.5561	0.8023	0.4629	0.8514	0.4147
4.50	0.7023	0.5538	0.8590	0.4373	0.9032	0.3899
5.00	0.7728	0.5412	0.9060	0.4074	0.9466	0.3605
5.50	0.8362	0.5197	0.9440	0.3755	0.9818	0.3284
6.00	0.8916	0.4908	0.9740	0.3425	1.0087	0.2945
6.50	0.9386	0.4553	0.9970	0.3097	1.0281	0.2605
7.00	0.9767	0.4181	1.0136	0.2777	1.0403	0.2276
7.50	1.0057	0.3779	1.0248	0.2470	1.0465	0.1968
8.00	1.0261	0.3373	1.0309	0.2183	1.0477	0.1689
8.50	1.0385	0.2978	1.0326	0.1920	1.0446	0.1443
9.00	1.0436	0.2610	1.0307	0.1685	1.0384	0.1236
9.50	1.0426	0.2276	1.0255	0.1484	1.0297	0.1067
10.00	1.0367	0.1988	1.0181	0.1318	1.0199	0.0938
10.50	1.0269	0.1749	1.0092	0.1190	1.0096	0.0848
11.00	1.0148	0.1561	0.9993	0.1098	0.9996	0.0791
11.50	1.0015	0.1426	0.9907	0.1043	0.9906	0.0764
12.00	0.9882	0.1339	0.9825	0.1018	0.9828	0.0761
12.50	0.9759	0.1295	0.9757	0.1016	0.9769	0.0777
13.00	0.9652	0.1289	0.9714	0.1033	0.9728	0.0806
13.50	0.9572	0.1312	0.9690	0.1061	0.9708	0.0843
14.00	0.9517	0.1355	0.9686	0.1092	0.9707	0.0882
14.50	0.9494	0.1410	0.9702	0.1120	0.9723	0.0917
15.00	0.9498	0.1467	0.9733	0.1142	0.9754	0.0946
15.50	0.9529	0.1522	0.9773	0.1153	0.9797	0.0965
16.00	0.9584	0.1563	0.9824	0.1153	0.9847	0.0972
16.50	0.9656	0.1592	0.9876	0.1141	0.9902	0.0967
17.00	0.9740	0.1598	0.9927	0.1117	0.9957	0.0949
17.50	0.9830	0.1585	0.9975	0.1084	1.0009	0.0918
18.00	0.9920	0.1552	1.0017	0.1043	1.0054	0.0877
18.50	1.0003	0.1498	1.0053	0.0994	1.0092	0.0827
19.00	1.0075	0.1428	1.0081	0.0942	1.0120	0.0773
19.50	1.0134	0.1344	1.0100	0.0886	1.0136	0.0715
20.00	1.0174	0.1252	1.0110	0.0830	1.0142	0.0657
20.50	1.0197	0.1157	1.0112	0.0774	1.0136	0.0601
21.00	1.0200	0.1062	1.0104	0.0721	1.0122	0.0550
21.50	1.0186	0.0973	1.0087	0.0675	1.0099	0.0506
22.00	1.0157	0.0894	1.0066	0.0631	1.0071	0.0471
22.50	1.0116	0.0820	1.0037	0.0596	1.0039	0.0444
23.00	1.0065	0.0774	1.0007	0.0572	1.0006	0.0426
23.50	1.0012	0.0738	0.9976	0.0555	0.9974	0.0418
24.00	0.9956	0.0717	0.9945	0.0550	0.9944	0.0419
24.50	0.9905	0.0712	0.9917	0.0552	0.9919	0.0426
25.00	0.9860	0.0719	0.9897	0.0561	0.9901	0.0439
25.50	0.9824	0.0738	0.9886	0.0574	0.9889	0.0456
26.00	0.9800	0.0765	0.9876	0.0591	0.9884	0.0474
26.50	0.9788	0.0795	0.9880	0.0607	0.9887	0.0492
27.00	0.9767	0.0827	0.9889	0.0622	0.9897	0.0509
27.50	0.9800	0.0857	0.9904	0.0633	0.9911	0.0522
28.00	0.9822	0.0882	0.9925	0.0639	0.9931	0.0529
28.50	0.9854	0.0899	0.9945	0.0640	0.9953	0.0533
29.00	0.9890	0.0903	0.9968	0.0634	0.9976	0.0530
29.50	0.9931	0.0908	0.9990	0.0624	1.0001	0.0522
30.00	0.9977	0.0896	1.0011	0.0608	1.0022	0.0508
30.50	1.0012	0.0875	1.0026	0.0589	1.0042	0.0488
31.00	1.0046	0.0846	1.0043	0.0567	1.0056	0.0466
31.50	1.0075	0.0810	1.0053	0.0543	1.0067	0.0441
32.00	1.0096	0.0767	1.0058	0.0517	1.0072	0.0414
32.50	1.0106	0.0723	1.0061	0.0492	1.0072	0.0388
33.00	1.0109	0.0680	1.0053	0.0466	1.0067	0.0363
33.50	1.0104	0.0635	1.0050	0.0444	1.0057	0.0340
34.00	1.0089	0.0596	1.0041	0.0423	1.0044	0.0321
34.50	1.0069	0.0563	1.0026	0.0405	1.0027	0.0307
35.00	1.0044	0.0536	1.0011	0.0392	1.0011	0.0296
35.50	1.0016	0.0516	0.9995	0.0382	0.9993	0.0292
36.00	0.9986	0.0504	0.9977	0.0379	0.9976	0.0290
36.50	0.9956	0.0502	0.9962	0.0379	0.9961	0.0294
37.00	0.9934	0.0505	0.9949	0.0383	0.9950	0.0300
37.50	0.9912	0.0514	0.9938	0.0392	0.9940	0.0309
38.00	0.9896	0.0528	0.9933	0.0401	0.9937	0.0320
38.50	0.9887	0.0546	0.9931	0.0412	0.9935	0.0332
39.00	0.9884	0.0564	0.9935	0.0422	0.9939	0.0343
39.50	0.9888	0.0582	0.9942	0.0430	0.9945	0.0352
40.00	0.9897	0.0598	0.9951	0.0437	0.9956	0.0359
40.50	0.9912	0.0611	0.9964	0.0440	0.9968	0.0363
41.00	0.9932	0.0619	0.9977	0.0439	0.9981	0.0365
41.50	0.9953	0.0622	0.9991	0.0436	0.9995	0.0361
42.00	0.9976	0.0619	1.0005	0.0429	1.0009	0.0356
42.50	0.9999	0.0611	1.0016	0.0418	1.0022	0.0345
43.00	1.0020	0.0598	1.0025	0.0407	1.0031	0.0335
43.50	1.0038	0.0579	1.0033	0.0393	1.0041	0.0319
44.00	1.0052	0.0557	1.0038	0.0378	1.0043	0.0304
44.50	1.0062	0.0534	1.0038	0.0362	1.0046	0.0289
45.00	1.0067	0.0508	1.0035	0.0348	1.0044	0.0273
45.50	1.0066	0.0482	1.0035	0.0333	1.0039	0.0259
46.00	1.0060	0.0459	1.0029	0.0320	1.0033	0.0246
46.50	1.0051	0.0437	1.0021	0.0309	1.0023	0.0235
47.00	1.0037	0.0416	1.0012	0.0300	1.0011	0.0229
47.50	1.0021	0.0404	1.0002	0.0293	1.0000	0.0224
48.00	1.0003	0.0394	0.9990	0.0289	0.9989	0.0223
48.50	0.9986	0.0390	0.9980	0.0290	0.9980	0.0225
49.00	0.9967	0.0390	0.9971	0.0292	0.9971	0.0228
49.50	0.9955	0.0393	0.9963	0.0295	0.9964	0.0233
50.00	0.9942	0.0400	0.9957	0.0302	0.9959	0.0239

APPENDIX C

SUPERSONIC RADIATION IMPEDANCE

	MACH NUMBER 1.50 WIDTH TO LENGTH RATIO 0.2500		MACH NUMBER 1.50 WIDTH TO LENGTH RATIO 0.5000		MACH NUMBER 1.50 WIDTH TO LENGTH RATIO 0.7500	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.10	-8785.3500	0.0183	-4392.6800	0.0284	-2928.4500	0.0334
0.20	-1002.6700	0.0385	-501.3350	0.0567	-334.2210	0.0665
0.30	-268.7910	0.0581	-134.3900	0.0846	-89.5884	0.0992
0.40	-101.4540	0.0774	-50.7174	0.1121	-33.8030	0.1313
0.50	-45.8255	0.0963	-22.8979	0.1390	-15.2516	0.1625
0.60	-22.9732	0.1148	-11.4654	0.1651	-7.6245	0.1926
0.70	-12.2285	0.1328	-6.0858	0.1904	-4.0316	0.2216
0.80	-6.6869	0.1504	-3.3069	0.2146	-2.1717	0.2492
0.90	-3.6335	0.1674	-1.7713	0.2379	-1.1400	0.2753
1.00	-1.8683	0.1839	-0.8791	0.2600	-0.5367	0.2999
1.10	-0.8115	0.1997	-0.3405	0.2809	-0.1687	0.3228
1.20	-0.1634	0.2149	-0.0058	0.3006	0.0638	0.3440
1.30	0.2401	0.2295	0.2070	0.3191	0.2153	0.3636
1.40	0.4927	0.2435	0.3446	0.3364	0.3169	0.3815
1.50	0.6500	0.2569	0.4348	0.3525	0.3868	0.3977
1.60	0.7461	0.2697	0.4945	0.3675	0.4365	0.4123
1.70	0.8024	0.2819	0.5342	0.3813	0.4727	0.4254
1.80	0.8325	0.2936	0.5608	0.3942	0.5000	0.4371
1.90	0.8454	0.3048	0.5787	0.4060	0.5213	0.4475
2.00	0.8470	0.3156	0.5908	0.4170	0.5384	0.4567
2.10	0.8413	0.3259	0.5990	0.4271	0.5526	0.4647
2.20	0.8310	0.3359	0.6047	0.4366	0.5647	0.4719
2.30	0.8179	0.3455	0.6087	0.4454	0.5754	0.4781
2.40	0.8032	0.3548	0.6117	0.4537	0.5849	0.4837
2.50	0.7879	0.3639	0.6141	0.4615	0.5937	0.4887
2.60	0.7725	0.3728	0.6162	0.4689	0.6019	0.4932
2.70	0.7574	0.3815	0.6183	0.4759	0.6096	0.4973
2.80	0.7428	0.3900	0.6204	0.4827	0.6171	0.5011
2.90	0.7291	0.3985	0.6227	0.4892	0.6244	0.5047
3.00	0.7163	0.4067	0.6253	0.4955	0.6317	0.5080
3.10	0.7044	0.4149	0.6283	0.5016	0.6389	0.5113
3.20	0.6935	0.4230	0.6317	0.5075	0.6461	0.5144
3.30	0.6837	0.4310	0.6355	0.5133	0.6536	0.5175
3.40	0.6748	0.4389	0.6399	0.5188	0.6612	0.5204
3.50	0.6671	0.4466	0.6447	0.5242	0.6690	0.5233
3.60	0.6603	0.4543	0.6501	0.5293	0.6771	0.5259
3.70	0.6545	0.4617	0.6559	0.5342	0.6855	0.5285
3.80	0.6496	0.4690	0.6623	0.5388	0.6942	0.5308
3.90	0.6457	0.4761	0.6691	0.5431	0.7032	0.5327
4.00	0.6426	0.4830	0.6764	0.5471	0.7125	0.5346
4.10	0.6403	0.4897	0.6842	0.5506	0.7221	0.5361
4.20	0.6388	0.4960	0.6923	0.5538	0.7320	0.5372
4.30	0.6380	0.5022	0.7009	0.5565	0.7421	0.5378
4.40	0.6379	0.5080	0.7097	0.5588	0.7525	0.5380
4.50	0.6384	0.5135	0.7187	0.5606	0.7627	0.5378
4.60	0.6395	0.5187	0.7280	0.5619	0.7732	0.5370
4.70	0.6411	0.5237	0.7375	0.5627	0.7837	0.5358
4.80	0.6431	0.5282	0.7470	0.5630	0.7942	0.5341
4.90	0.6456	0.5325	0.7566	0.5629	0.8046	0.5318
5.00	0.6484	0.5365	0.7661	0.5623	0.8148	0.5292
5.10	0.6515	0.5401	0.7757	0.5613	0.8248	0.5260
5.20	0.6549	0.5435	0.7851	0.5598	0.8347	0.5225
5.30	0.6585	0.5467	0.7944	0.5580	0.8442	0.5186
5.40	0.6624	0.5495	0.8036	0.5558	0.8534	0.5143
5.50	0.6664	0.5522	0.8126	0.5533	0.8623	0.5098
5.60	0.6706	0.5546	0.8214	0.5505	0.8708	0.5051
5.70	0.6749	0.5568	0.8300	0.5475	0.8790	0.5001
5.80	0.6794	0.5589	0.8384	0.5443	0.8869	0.4950
5.90	0.6840	0.5609	0.8466	0.5409	0.8944	0.4898
6.00	0.6887	0.5627	0.8546	0.5374	0.9015	0.4846
6.10	0.6935	0.5643	0.8624	0.5337	0.9084	0.4793
6.20	0.6984	0.5659	0.8701	0.5299	0.9149	0.4741
6.30	0.7034	0.5674	0.8775	0.5260	0.9212	0.4688
6.40	0.7086	0.5687	0.8849	0.5221	0.9273	0.4636
6.50	0.7139	0.5700	0.8921	0.5181	0.9332	0.4585
6.60	0.7194	0.5712	0.8992	0.5140	0.9389	0.4534
6.70	0.7250	0.5723	0.9062	0.5098	0.9445	0.4484
6.80	0.7307	0.5733	0.9131	0.5056	0.9500	0.4434
6.90	0.7366	0.5741	0.9200	0.5012	0.9553	0.4385
7.00	0.7426	0.5748	0.9267	0.4968	0.9606	0.4335
7.10	0.7488	0.5754	0.9334	0.4923	0.9659	0.4286
7.20	0.7551	0.5758	0.9401	0.4876	0.9711	0.4237
7.30	0.7616	0.5760	0.9466	0.4828	0.9762	0.4187
7.40	0.7682	0.5760	0.9531	0.4778	0.9813	0.4136
7.50	0.7748	0.5758	0.9595	0.4727	0.9864	0.4084
7.60	0.7816	0.5754	0.9658	0.4674	0.9914	0.4032
7.70	0.7884	0.5747	0.9719	0.4619	0.9962	0.3978
7.80	0.7953	0.5738	0.9779	0.4563	1.0010	0.3923
7.90	0.8022	0.5726	0.9837	0.4505	1.0056	0.3866
8.00	0.8091	0.5712	0.9893	0.4445	1.0101	0.3809
8.10	0.8159	0.5696	0.9947	0.4383	1.0145	0.3749
8.20	0.8227	0.5676	0.9999	0.4320	1.0186	0.3689
8.30	0.8294	0.5655	1.0048	0.4256	1.0225	0.3627
8.40	0.8360	0.5631	1.0094	0.4191	1.0261	0.3565
8.50	0.8425	0.5605	1.0138	0.4125	1.0295	0.3501
8.60	0.8488	0.5578	1.0180	0.4058	1.0326	0.3438
8.70	0.8549	0.5549	1.0218	0.3990	1.0355	0.3373
8.80	0.8609	0.5518	1.0253	0.3923	1.0381	0.3309
8.90	0.8667	0.5487	1.0286	0.3855	1.0403	0.3245
9.00	0.8723	0.5454	1.0315	0.3788	1.0424	0.3182
9.10	0.8778	0.5421	1.0343	0.3721	1.0441	0.3119
9.20	0.8830	0.5388	1.0367	0.3655	1.0456	0.3058
9.30	0.8881	0.5354	1.0389	0.3590	1.0469	0.2997
9.40	0.8931	0.5321	1.0409	0.3526	1.0479	0.2938
9.50	0.8979	0.5288	1.0427	0.3463	1.0488	0.2881
9.60	0.9026	0.5255	1.0443	0.3401	1.0495	0.2825
9.70	0.9072	0.5222	1.0457	0.3340	1.0500	0.2771
9.80	0.9118	0.5190	1.0470	0.3280	1.0504	0.2718
9.90	0.9163	0.5159	1.0482	0.3222	1.0508	0.2667
10.00	0.9208	0.5128	1.0492	0.3165	1.0510	0.2617

	MACH NUMBER 1.50 WIDTH TO LENGTH RATIO 1.0000		MACH NUMBER 1.50 WIDTH TO LENGTH RATIO 2.0000		MACH NUMBER 1.50 WIDTH TO LENGTH RATIO 4.0000	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.10	-2196.3400	0.0362	-1098.1700	0.0404	-549.0850	0.0425
0.20	-250.6640	0.0721	-125.3280	0.0805	-62.6606	0.0847
0.30	-67.1874	0.1075	-33.5857	0.1200	-16.7849	0.1262
0.40	-25.3452	0.1421	-12.6586	0.1584	-6.3152	0.1666
0.50	-11.4281	0.1757	-5.6923	0.1957	-2.8245	0.2056
0.60	-5.7030	0.2081	-2.8207	0.2314	-1.3795	0.2430
0.70	-3.0031	0.2390	-1.4602	0.2653	-0.6888	0.2784
0.80	-1.6023	0.2684	-0.7401	0.2973	-0.3210	0.3117
0.90	-0.8222	0.2960	-0.3453	0.3271	-0.1068	0.3426
1.00	-0.3629	0.3217	-0.1020	0.3546	0.0285	0.3710
1.10	-0.0797	0.3455	0.0540	0.3797	0.1208	0.3968
1.20	0.1021	0.3674	0.1598	0.4025	0.1867	0.4200
1.30	0.2234	0.3872	0.2357	0.4227	0.2419	0.4404
1.40	0.3073	0.4051	0.2932	0.4405	0.2861	0.4582
1.50	0.3675	0.4210	0.3388	0.4559	0.3245	0.4734
1.60	0.4124	0.4351	0.3767	0.4691	0.3580	0.4861
1.70	0.4472	0.4473	0.4092	0.4800	0.3902	0.4964
1.80	0.4751	0.4579	0.4379	0.4890	0.4193	0.5045
1.90	0.4982	0.4670	0.4638	0.4960	0.4465	0.5105
2.00	0.5179	0.4747	0.4873	0.5014	0.4720	0.5148
2.10	0.5350	0.4811	0.5089	0.5053	0.4959	0.5175
2.20	0.5503	0.4864	0.5289	0.5080	0.5184	0.5187
2.30	0.5641	0.4908	0.5475	0.5095	0.5391	0.5188
2.40	0.5767	0.4944	0.5646	0.5102	0.5586	0.5180
2.50	0.5884	0.4974	0.5806	0.5101	0.5767	0.5165
2.60	0.5993	0.4999	0.5954	0.5096	0.5935	0.5144
2.70	0.6095	0.5021	0.6093	0.5087	0.6092	0.5121
2.80	0.6191	0.5039	0.6222	0.5076	0.6237	0.5095
2.90	0.6284	0.5056	0.6343	0.5065	0.6372	0.5069
3.00	0.6373	0.5072	0.6457	0.5053	0.6499	0.5044
3.10	0.6460	0.5087	0.6566	0.5042	0.6619	0.5020
3.20	0.6546	0.5102	0.6670	0.5033	0.6732	0.4979
3.30	0.6631	0.5117	0.6771	0.5026	0.6841	0.4981
3.40	0.6716	0.5133	0.6870	0.5021	0.6947	0.4965
3.50	0.6803	0.5148	0.6967	0.5018	0.7050	0.4952
3.60	0.6890	0.5164	0.7065	0.5016	0.7152	0.4942
3.70	0.6980	0.5178	0.7162	0.5016	0.7254	0.4934
3.80	0.7072	0.5192	0.7261	0.5016	0.7356	0.4928
3.90	0.7166	0.5205	0.7362	0.5016	0.7460	0.4922
4.00	0.7263	0.5215	0.7464	0.5016	0.7565	0.4917
4.10	0.7363	0.5223	0.7569	0.5014	0.7672	0.4910
4.20	0.7465	0.5227	0.7676	0.5011	0.7781	0.4902
4.30	0.7569	0.5229	0.7784	0.5004	0.7892	0.4892
4.40	0.7674	0.5226	0.7895	0.4995	0.8005	0.4879
4.50	0.7782	0.5218	0.8006	0.4981	0.8119	0.4863
4.60	0.7889	0.5207	0.8119	0.4963	0.8233	0.4842
4.70	0.7997	0.5190	0.8231	0.4941	0.8348	0.4817
4.80	0.8105	0.5168	0.8343	0.4914	0.8463	0.4787
4.90	0.8211	0.5142	0.8455	0.4882	0.8576	0.4751
5.00	0.8316	0.5111	0.8566	0.4844	0.8689	0.4711
5.10	0.8419	0.5075	0.8671	0.4802	0.8797	0.4666
5.20	0.8520	0.5035	0.8776	0.4756	0.8904	0.4617
5.30	0.8617	0.4991	0.8876	0.4706	0.9006	0.4563
5.40	0.8711	0.4944	0.8973	0.4651	0.9105	0.4505
5.50	0.8801	0.4894	0.9066	0.4594	0.9199	0.4444
5.60	0.8887	0.4841	0.9154	0.4534	0.9288	0.4380
5.70	0.8969	0.4786	0.9238	0.4471	0.9372	0.4314
5.80	0.9047	0.4730	0.9317	0.4408	0.9451	0.4246
5.90	0.9122	0.4673	0.9391	0.4343	0.9526	0.4178
6.00	0.9192	0.4616	0.9461	0.4278	0.9595	0.4109
6.10	0.9259	0.4558	0.9526	0.4213	0.9659	0.4040
6.20	0.9323	0.4501	0.9587	0.4149	0.9720	0.3972
6.30	0.9384	0.4445	0.9645	0.4085	0.9776	0.3905
6.40	0.9442	0.4389	0.9699	0.4022	0.9828	0.3839
6.50	0.9497	0.4334	0.9751	0.3961	0.9878	0.3775
6.60	0.9551	0.4280	0.9800	0.3902	0.9925	0.3713
6.70	0.9603	0.4226	0.9847	0.3843	0.9969	0.3652
6.80	0.9654	0.4174	0.9893	0.3787	1.0012	0.3593
6.90	0.9704	0.4123	0.9937	0.3731	1.0053	0.3535
7.00	0.9753	0.4072	0.9980	0.3677	1.0094	0.3479
7.10	0.9801	0.4021	1.0023	0.3623	1.0133	0.3425
7.20	0.9850	0.3970	1.0065	0.3571	1.0173	0.3371
7.30	0.9897	0.3920	1.0107	0.3518	1.0211	0.3317
7.40	0.9945	0.3869	1.0148	0.3466	1.0250	0.3264
7.50	0.9991	0.3817	1.0189	0.3413	1.0288	0.3211
7.60	1.0038	0.3764	1.0230	0.3360	1.0326	0.3157
7.70	1.0083	0.3711	1.0270	0.3306	1.0364	0.3103
7.80	1.0128	0.3656	1.0310	0.3251	1.0401	0.3048
7.90	1.0171	0.3600	1.0349	0.3194	1.0437	0.2992
8.00	1.0214	0.3542	1.0386	0.3137	1.0472	0.2934
8.10	1.0254	0.3483	1.0422	0.3078	1.0506	0.2876
8.20	1.0293	0.3423	1.0456	0.3018	1.0538	0.2816
8.30	1.0329	0.3362	1.0489	0.2957	1.0568	0.2755
8.40	1.0364	0.3300	1.0519	0.2895	1.0596	0.2693
8.50	1.0395	0.3236	1.0546	0.2832	1.0622	0.2630
8.60	1.0424	0.3173	1.0571	0.2768	1.0645	0.2566
8.70	1.0450	0.3108	1.0593	0.2704	1.0664	0.2502
8.80	1.0474	0.3044	1.0612	0.2640	1.0681	0.2438
8.90	1.0494	0.2980	1.0628	0.2576	1.0695	0.2374
9.00	1.0512	0.2916	1.0642	0.2512	1.0706	0.2310
9.10	1.0527	0.2854	1.0652	0.2449	1.0714	0.2247
9.20	1.0539	0.2792	1.0659	0.2388	1.0720	0.2185
9.30	1.0549	0.2731	1.0664	0.2327	1.0722	0.2125
9.40	1.0556	0.2672	1.0667	0.2268	1.0722	0.2067
9.50	1.0561	0.2614	1.0667	0.2211	1.0720	0.2010
9.60	1.0565	0.2559	1.0665	0.2156	1.0715	0.1955
9.70	1.0567	0.2505	1.0662	0.2103	1.0709	0.1902
9.80	1.0568	0.2452	1.0657	0.2052	1.0702	0.1852
9.90	1.0567	0.2402	1.0651	0.2003	1.0693	0.1803
10.00	1.0566	0.2353	1.0645	0.1956	1.0684	0.1757

	MACH NUMBER 2.00 WIDTH TO LENGTH RATIO 0.2500		MACH NUMBER 2.00 WIDTH TO LENGTH RATIO 0.5000		MACH NUMBER 2.00 WIDTH TO LENGTH RATIO 0.7500	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.10	-29539.2000	0.0162	-14769.6000	0.0218	-9846.3899	0.0241
0.20	-3565.0700	0.0324	-1782.5300	0.0435	-1188.3500	0.0482
0.30	-1018.5900	0.0486	-509.2920	0.0652	-339.5260	0.0722
0.40	-413.7990	0.0646	-206.8950	0.0868	-137.9270	0.0961
0.50	-203.7120	0.0806	-101.8490	0.1081	-67.8941	0.1197
0.60	-113.1680	0.0965	-56.5740	0.1293	-37.7084	0.1431
0.70	-68.2903	0.1123	-34.1314	0.1502	-22.7440	0.1661
0.80	-43.7523	0.1279	-21.8583	0.1709	-14.5588	0.1889
0.90	-29.3228	0.1433	-14.6389	0.1912	-9.7424	0.2112
1.00	-20.3480	0.1585	-10.1464	0.2112	-6.7435	0.2331
1.10	-14.5117	0.1735	-7.2226	0.2308	-4.7902	0.2545
1.20	-10.5764	0.1883	-5.2489	0.2500	-3.4698	0.2754
1.30	-7.8421	0.2029	-3.8752	0.2687	-2.5492	0.2957
1.40	-5.8937	0.2172	-2.8941	0.2870	-1.8899	0.3155
1.50	-4.4750	0.2312	-2.1775	0.3047	-1.4067	0.3346
1.60	-3.4227	0.2450	-1.6436	0.3220	-1.0451	0.3531
1.70	-2.6294	0.2584	-1.2389	0.3386	-0.7694	0.3709
1.80	-2.0226	0.2715	-0.9272	0.3548	-0.5553	0.3880
1.90	-1.5526	0.2844	-0.6835	0.3703	-0.3865	0.4044
2.00	-1.1843	0.2969	-0.4904	0.3852	-0.2512	0.4200
2.10	-0.8927	0.3090	-0.3355	0.3996	-0.1411	0.4349
2.20	-0.6597	0.3208	-0.2095	0.4133	-0.0503	0.4490
2.30	-0.4717	0.3323	-0.1059	0.4263	0.0258	0.4625
2.40	-0.3189	0.3434	-0.0198	0.4388	0.0904	0.4749
2.50	-0.1937	0.3542	0.0528	0.4506	0.1459	0.4867
2.60	-0.0903	0.3647	0.1145	0.4617	0.1943	0.4976
2.70	-0.0043	0.3747	0.1676	0.4722	0.2370	0.5078
2.80	0.0676	0.3845	0.2137	0.4821	0.2751	0.5173
2.90	0.1283	0.3938	0.2543	0.4914	0.3095	0.5259
3.00	0.1798	0.4029	0.2903	0.5000	0.3408	0.5338
3.10	0.2238	0.4116	0.3225	0.5081	0.3696	0.5410
3.20	0.2616	0.4200	0.3517	0.5155	0.3962	0.5474
3.30	0.2944	0.4280	0.3782	0.5223	0.4210	0.5532
3.40	0.3230	0.4357	0.4026	0.5286	0.4443	0.5582
3.50	0.3481	0.4431	0.4251	0.5343	0.4663	0.5626
3.60	0.3703	0.4502	0.4461	0.5395	0.4871	0.5663
3.70	0.3901	0.4570	0.4658	0.5441	0.5069	0.5694
3.80	0.4078	0.4635	0.4843	0.5483	0.5258	0.5719
3.90	0.4238	0.4698	0.5018	0.5520	0.5438	0.5739
4.00	0.4384	0.4757	0.5183	0.5552	0.5611	0.5753
4.10	0.4517	0.4814	0.5341	0.5580	0.5776	0.5762
4.20	0.4640	0.4869	0.5492	0.5603	0.5936	0.5766
4.30	0.4753	0.4921	0.5636	0.5623	0.6089	0.5766
4.40	0.4859	0.4971	0.5775	0.5639	0.6236	0.5762
4.50	0.4959	0.5019	0.5908	0.5652	0.6378	0.5753
4.60	0.5053	0.5065	0.6036	0.5661	0.6514	0.5742
4.70	0.5142	0.5109	0.6160	0.5667	0.6645	0.5726
4.80	0.5227	0.5150	0.6279	0.5670	0.6772	0.5708
4.90	0.5309	0.5191	0.6395	0.5671	0.6894	0.5688
5.00	0.5387	0.5229	0.6506	0.5669	0.7011	0.5664
5.10	0.5463	0.5266	0.6615	0.5665	0.7124	0.5639
5.20	0.5537	0.5301	0.6720	0.5659	0.7233	0.5612
5.30	0.5608	0.5335	0.6821	0.5651	0.7338	0.5583
5.40	0.5678	0.5367	0.6920	0.5642	0.7439	0.5552
5.50	0.5747	0.5398	0.7016	0.5631	0.7537	0.5520
5.60	0.5815	0.5428	0.7110	0.5618	0.7631	0.5488
5.70	0.5881	0.5457	0.7201	0.5604	0.7721	0.5454
5.80	0.5947	0.5484	0.7290	0.5589	0.7809	0.5420
5.90	0.6012	0.5511	0.7376	0.5574	0.7893	0.5385
6.00	0.6077	0.5536	0.7461	0.5557	0.7975	0.5350
6.10	0.6141	0.5560	0.7544	0.5539	0.8055	0.5315
6.20	0.6205	0.5583	0.7625	0.5520	0.8131	0.5279
6.30	0.6269	0.5605	0.7704	0.5501	0.8206	0.5244
6.40	0.6333	0.5626	0.7782	0.5481	0.8278	0.5208
6.50	0.6397	0.5646	0.7859	0.5461	0.8349	0.5173
6.60	0.6461	0.5665	0.7934	0.5439	0.8418	0.5137
6.70	0.6525	0.5683	0.8008	0.5418	0.8485	0.5102
6.80	0.6589	0.5700	0.8081	0.5395	0.8550	0.5067
6.90	0.6653	0.5716	0.8154	0.5373	0.8615	0.5032
7.00	0.6718	0.5730	0.8225	0.5349	0.8678	0.4997
7.10	0.6783	0.5744	0.8296	0.5325	0.8740	0.4962
7.20	0.6849	0.5756	0.8365	0.5300	0.8801	0.4928
7.30	0.6914	0.5768	0.8434	0.5275	0.8861	0.4893
7.40	0.6980	0.5778	0.8503	0.5249	0.8921	0.4859
7.50	0.7047	0.5786	0.8571	0.5222	0.8979	0.4824
7.60	0.7114	0.5794	0.8638	0.5195	0.9037	0.4790
7.70	0.7181	0.5800	0.8705	0.5167	0.9095	0.4755
7.80	0.7248	0.5805	0.8771	0.5137	0.9152	0.4720
7.90	0.7316	0.5808	0.8837	0.5107	0.9209	0.4684
8.00	0.7384	0.5810	0.8902	0.5076	0.9265	0.4649
8.10	0.7452	0.5811	0.8966	0.5044	0.9320	0.4612
8.20	0.7520	0.5810	0.9030	0.5011	0.9376	0.4576
8.30	0.7588	0.5808	0.9094	0.4977	0.9430	0.4538
8.40	0.7657	0.5804	0.9157	0.4942	0.9485	0.4500
8.50	0.7725	0.5799	0.9219	0.4905	0.9538	0.4461
8.60	0.7794	0.5792	0.9280	0.4868	0.9592	0.4421
8.70	0.7862	0.5783	0.9341	0.4829	0.9644	0.4381
8.80	0.7931	0.5773	0.9400	0.4789	0.9696	0.4339
8.90	0.7999	0.5761	0.9459	0.4748	0.9748	0.4297
9.00	0.8066	0.5748	0.9517	0.4705	0.9799	0.4254
9.10	0.8134	0.5733	0.9574	0.4662	0.9848	0.4209
9.20	0.8201	0.5717	0.9630	0.4617	0.9897	0.4164
9.30	0.8268	0.5699	0.9684	0.4571	0.9945	0.4117
9.40	0.8334	0.5680	0.9737	0.4523	0.9992	0.4070
9.50	0.8399	0.5659	0.9789	0.4475	1.0038	0.4021
9.60	0.8464	0.5637	0.9840	0.4425	1.0083	0.3972
9.70	0.8528	0.5613	0.9889	0.4374	1.0126	0.3921
9.80	0.8591	0.5588	0.9937	0.4322	1.0168	0.3869
9.90	0.8654	0.5561	0.9982	0.4270	1.0208	0.3817
10.00	0.8715	0.5533	1.0027	0.4216	1.0247	0.3763

	MACH NUMBER 2.00 WIDTH TO LENGTH RATIO 1.0000		MACH NUMBER 2.00 WIDTH TO LENGTH RATIO 2.0000		MACH NUMBER 2.00 WIDTH TO LENGTH RATIO 4.0000	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.10	-7384.7900	0.0253	-3692.3900	0.0271	-1846.2000	0.0280
0.20	-891.2660	0.0506	-445.6320	0.0541	-222.8140	0.0559
0.30	-254.6430	0.0757	-127.3190	0.0810	-63.6565	0.0836
0.40	-103.4420	0.1007	-51.7161	0.1077	-25.8529	0.1112
0.50	-50.9166	0.1255	-25.4503	0.1342	-12.7172	0.1385
0.60	-28.2756	0.1500	-14.1264	0.1603	-7.0518	0.1655
0.70	-17.0502	0.1741	-8.5096	0.1860	-4.2393	0.1920
0.80	-10.9090	0.1979	-5.4344	0.2114	-2.6971	0.2181
0.90	-7.2941	0.2212	-3.6217	0.2362	-1.7855	0.2437
1.00	-5.0421	0.2440	-2.4899	0.2605	-1.2138	0.2687
1.10	-3.5739	0.2664	-1.7495	0.2842	-0.8374	0.2931
1.20	-2.5803	0.0000	-1.2459	0.3072	-0.5788	0.3168
1.30	-1.8861	0.0000	-0.8916	0.3296	-0.3943	0.3397
1.40	-1.3878	0.3298	-0.6347	0.3512	-0.2581	0.3619
1.50	-1.0214	0.3496	-0.4433	0.3720	-0.1542	0.3833
1.60	-0.7459	0.3687	-0.2970	0.3921	-0.0725	0.4038
1.70	-0.5346	0.3870	-0.1824	0.4113	-0.0062	0.4234
1.80	-0.3694	0.4046	-0.0905	0.4296	0.0490	0.4421
1.90	-0.2380	0.4214	-0.0152	0.4470	0.0962	0.4598
2.00	-0.1315	0.4374	0.0479	0.4635	0.1377	0.4766
2.10	-0.0439	0.4526	0.1019	0.4791	0.1748	0.4923
2.20	0.0294	0.4669	0.1489	0.4937	0.2086	0.5071
2.30	0.0917	0.4803	0.1906	0.5074	0.2400	0.5209
2.40	0.1455	0.4929	0.2282	0.5200	0.2695	0.5336
2.50	0.1926	0.5047	0.2625	0.5318	0.2975	0.5453
2.60	0.2343	0.5156	0.2943	0.5425	0.3243	0.5560
2.70	0.2718	0.5256	0.3240	0.5523	0.3501	0.5657
2.80	0.3059	0.5348	0.3520	0.5612	0.3751	0.5743
2.90	0.3372	0.5432	0.3787	0.5691	0.3994	0.5820
3.00	0.3661	0.5507	0.4041	0.5760	0.4231	0.5887
3.10	0.3931	0.5574	0.4285	0.5821	0.4462	0.5944
3.20	0.4185	0.5634	0.4520	0.5873	0.4687	0.5992
3.30	0.4425	0.5685	0.4747	0.5916	0.4908	0.6031
3.40	0.4652	0.5729	0.4966	0.5951	0.5123	0.6062
3.50	0.4869	0.5766	0.5179	0.5978	0.5333	0.6083
3.60	0.5076	0.5796	0.5384	0.5997	0.5537	0.6097
3.70	0.5275	0.5820	0.5584	0.6008	0.5739	0.6103
3.80	0.5465	0.5837	0.5777	0.6013	0.5933	0.6101
3.90	0.5649	0.5847	0.5965	0.6011	0.6123	0.6092
4.00	0.5825	0.5853	0.6146	0.6002	0.6307	0.6077
4.10	0.5995	0.5852	0.6322	0.5988	0.6485	0.6056
4.20	0.6158	0.5847	0.6491	0.5968	0.6658	0.6028
4.30	0.6315	0.5837	0.6655	0.5943	0.6825	0.5996
4.40	0.6467	0.5822	0.6813	0.5913	0.6986	0.5958
4.50	0.6613	0.5803	0.6965	0.5879	0.7142	0.5916
4.60	0.6753	0.5781	0.7112	0.5840	0.7291	0.5870
4.70	0.6888	0.5755	0.7253	0.5799	0.7435	0.5820
4.80	0.7018	0.5726	0.7388	0.5754	0.7573	0.5767
4.90	0.7143	0.5695	0.7518	0.5706	0.7705	0.5711
5.00	0.7264	0.5661	0.7642	0.5655	0.7831	0.5653
5.10	0.7379	0.5625	0.7761	0.5603	0.7952	0.5593
5.20	0.7490	0.5587	0.7875	0.5549	0.8067	0.5531
5.30	0.7596	0.5547	0.7983	0.5494	0.8177	0.5467
5.40	0.7698	0.5506	0.8087	0.5437	0.8282	0.5403
5.50	0.7796	0.5464	0.8186	0.5380	0.8381	0.5338
5.60	0.7891	0.5421	0.8281	0.5322	0.8476	0.5272
5.70	0.7981	0.5378	0.8371	0.5264	0.8566	0.5207
5.80	0.8068	0.5334	0.8457	0.5205	0.8651	0.5141
5.90	0.8152	0.5290	0.8539	0.5147	0.8732	0.5076
6.00	0.8232	0.5246	0.8617	0.5089	0.8809	0.5011
6.10	0.8309	0.5202	0.8691	0.5032	0.8882	0.4947
6.20	0.8384	0.5158	0.8763	0.4975	0.8952	0.4884
6.30	0.8456	0.5114	0.8831	0.4920	0.9019	0.4822
6.40	0.8526	0.5071	0.8896	0.4865	0.9082	0.4762
6.50	0.8593	0.5028	0.8959	0.4810	0.9142	0.4702
6.60	0.8658	0.4985	0.9020	0.4757	0.9200	0.4644
6.70	0.8722	0.4943	0.9078	0.4705	0.9256	0.4587
6.80	0.8784	0.4902	0.9134	0.4655	0.9309	0.4531
6.90	0.8844	0.4861	0.9188	0.4605	0.9360	0.4477
7.00	0.8903	0.4821	0.9241	0.4556	0.9410	0.4424
7.10	0.8961	0.4781	0.9292	0.4508	0.9458	0.4372
7.20	0.9018	0.4741	0.9342	0.4462	0.9505	0.4322
7.30	0.9073	0.4702	0.9391	0.4416	0.9550	0.4272
7.40	0.9128	0.4664	0.9439	0.4371	0.9595	0.4224
7.50	0.9182	0.4625	0.9487	0.4327	0.9639	0.4178
7.60	0.9236	0.4587	0.9533	0.4283	0.9682	0.4132
7.70	0.9289	0.4549	0.9579	0.4241	0.9724	0.4086
7.80	0.9341	0.4511	0.9625	0.4198	0.9767	0.4042
7.90	0.9393	0.4473	0.9670	0.4157	0.9808	0.3998
8.00	0.9445	0.4435	0.9715	0.4115	0.9850	0.3955
8.10	0.9496	0.4397	0.9759	0.4074	0.9891	0.3912
8.20	0.9547	0.4358	0.9803	0.4032	0.9932	0.3869
8.30	0.9597	0.4319	0.9847	0.3991	0.9973	0.3827
8.40	0.9647	0.4280	0.9891	0.3950	1.0013	0.3785
8.50	0.9697	0.4240	0.9935	0.3908	1.0054	0.3742
8.60	0.9746	0.4199	0.9978	0.3866	1.0094	0.3699
8.70	0.9795	0.4158	1.0021	0.3823	1.0134	0.3656
8.80	0.9843	0.4116	1.0064	0.3780	1.0174	0.3613
8.90	0.9891	0.4073	1.0106	0.3737	1.0213	0.3569
9.00	0.9938	0.4029	1.0148	0.3692	1.0253	0.3524
9.10	0.9985	0.3984	1.0189	0.3647	1.0291	0.3477
9.20	1.0030	0.3939	1.0230	0.3601	1.0329	0.3433
9.30	1.0075	0.3892	1.0270	0.3555	1.0367	0.3386
9.40	1.0119	0.3845	1.0309	0.3507	1.0404	0.3338
9.50	1.0162	0.3796	1.0347	0.3458	1.0440	0.3289
9.60	1.0204	0.3746	1.0385	0.3409	1.0476	0.3240
9.70	1.0244	0.3696	1.0421	0.3358	1.0510	0.3190
9.80	1.0283	0.3644	1.0456	0.3307	1.0543	0.3138
9.90	1.0321	0.3592	1.0490	0.3255	1.0575	0.3086
10.00	1.0359	0.3539	1.0523	0.3202	1.0606	0.3033

	MACH NUMBER 2.50 WIDTH TO LENGTH RATIO 0.2500		MACH NUMBER 2.50 WIDTH TO LENGTH RATIO 0.5000		MACH NUMBER 2.50 WIDTH TO LENGTH RATIO 0.7500	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.10	-65571.7998	0.0140	-32785.8999	0.0178	-21857.2998	0.0191
0.20	-8037.3199	0.0281	-4018.6600	0.0355	-2679.1100	0.0382
0.30	-2334.2700	0.0421	-1167.1300	0.0533	-778.0880	0.0573
0.40	-964.8740	0.0560	-482.4340	0.0709	-321.6210	0.0763
0.50	-483.8270	0.0700	-241.9090	0.0885	-161.2700	0.0952
0.60	-274.0940	0.0839	-137.0410	0.1060	-91.3566	0.1140
0.70	-168.8910	0.0977	-84.4374	0.1234	-56.2860	0.1327
0.80	-110.6520	0.1114	-55.3153	0.1407	-36.8696	0.1512
0.90	-75.9619	0.1251	-37.9675	0.1578	-25.3025	0.1696
1.00	-54.0963	0.1386	-27.0316	0.1748	-18.0097	0.1878
1.10	-39.6793	0.1521	-19.8197	0.1916	-13.1994	0.2058
1.20	-29.8181	0.1654	-14.8854	0.2082	-9.9073	0.2236
1.30	-22.8642	0.1787	-11.4045	0.2246	-7.5839	0.2411
1.40	-17.8326	0.1917	-8.8843	0.2408	-5.9009	0.2584
1.50	-14.1108	0.2047	-7.0189	0.2568	-4.6541	0.2754
1.60	-11.3048	0.2175	-5.6110	0.2725	-3.7122	0.2921
1.70	-9.1537	0.2301	-4.5303	0.2879	-2.9882	0.3085
1.80	-7.4803	0.2426	-3.6882	0.3031	-2.4231	0.3246
1.90	-6.1612	0.2549	-3.0230	0.3179	-1.9757	0.3403
2.00	-5.1091	0.2670	-2.4911	0.3325	-1.6171	0.3557
2.10	-4.2612	0.2790	-2.0610	0.3467	-1.3262	0.3708
2.20	-3.5710	0.2907	-1.7096	0.3607	-1.0875	0.3854
2.30	-3.0044	0.3022	-1.4198	0.3742	-0.8898	0.3997
2.40	-2.5354	0.3136	-1.1785	0.3875	-0.7243	0.4136
2.50	-2.1442	0.3247	-0.9759	0.4004	-0.5845	0.4270
2.60	-1.8157	0.3356	-0.8045	0.4129	-0.4653	0.4400
2.70	-1.5380	0.3462	-0.6584	0.4250	-0.3627	0.4526
2.80	-1.3017	0.3567	-0.5328	0.4368	-0.2740	0.4648
2.90	-1.0996	0.3669	-0.4241	0.4482	-0.1964	0.4765
3.00	-0.9257	0.3768	-0.3294	0.4591	-0.1279	0.4878
3.10	-0.7753	0.3866	-0.2463	0.4697	-0.0671	0.4986
3.20	-0.6446	0.3960	-0.1729	0.4799	-0.0127	0.5089
3.30	-0.5303	0.4053	-0.1077	0.4897	0.0363	0.5188
3.40	-0.4300	0.4143	-0.0493	0.4991	0.0808	0.5282
3.50	-0.3416	0.4230	0.0032	0.5080	0.1215	0.5372
3.60	-0.2632	0.4315	0.0508	0.5166	0.1589	0.5456
3.70	-0.1935	0.4397	0.0941	0.5247	0.1935	0.5536
3.80	-0.1311	0.4477	0.1337	0.5324	0.2257	0.5611
3.90	-0.0752	0.4554	0.1702	0.5398	0.2558	0.5682
4.00	-0.0247	0.4629	0.2040	0.5466	0.2841	0.5747
4.10	0.0210	0.4701	0.2354	0.5531	0.3109	0.5808
4.20	0.0625	0.4770	0.2647	0.5592	0.3362	0.5864
4.30	0.1004	0.4838	0.2922	0.5649	0.3603	0.5916
4.40	0.1351	0.4902	0.3182	0.5702	0.3834	0.5963
4.50	0.1670	0.4964	0.3427	0.5750	0.4055	0.6006
4.60	0.1965	0.5024	0.3659	0.5795	0.4267	0.6044
4.70	0.2238	0.5081	0.3880	0.5836	0.4471	0.6077
4.80	0.2492	0.5135	0.4091	0.5873	0.4668	0.6107
4.90	0.2729	0.5187	0.4293	0.5906	0.4859	0.6132
5.00	0.2951	0.5237	0.4487	0.5936	0.5043	0.6153
5.10	0.3160	0.5285	0.4673	0.5962	0.5222	0.6170
5.20	0.3357	0.5330	0.4852	0.5984	0.5395	0.6182
5.30	0.3542	0.5373	0.5025	0.6003	0.5564	0.6191
5.40	0.3718	0.5413	0.5192	0.6019	0.5728	0.6196
5.50	0.3886	0.5452	0.5353	0.6031	0.5887	0.6198
5.60	0.4045	0.5488	0.5510	0.6040	0.6042	0.6196
5.70	0.4197	0.5522	0.5661	0.6046	0.6193	0.6190
5.80	0.4343	0.5554	0.5808	0.6049	0.6340	0.6181
5.90	0.4483	0.5585	0.5951	0.6049	0.6483	0.6169
6.00	0.4616	0.5613	0.6090	0.6046	0.6622	0.6154
6.10	0.4747	0.5639	0.6224	0.6041	0.6758	0.6136
6.20	0.4872	0.5663	0.6355	0.6032	0.6890	0.6114
6.30	0.4993	0.5686	0.6483	0.6022	0.7018	0.6091
6.40	0.5109	0.5706	0.6607	0.6009	0.7143	0.6064
6.50	0.5223	0.5725	0.6727	0.5993	0.7265	0.6035
6.60	0.5332	0.5743	0.6844	0.5975	0.7383	0.6004
6.70	0.5439	0.5758	0.6958	0.5956	0.7498	0.5971
6.80	0.5543	0.5772	0.7069	0.5934	0.7609	0.5935
6.90	0.5644	0.5785	0.7176	0.5910	0.7717	0.5898
7.00	0.5743	0.5796	0.7281	0.5885	0.7822	0.5858
7.10	0.5839	0.5806	0.7383	0.5858	0.7924	0.5817
7.20	0.5933	0.5814	0.7482	0.5829	0.8023	0.5775
7.30	0.6024	0.5821	0.7578	0.5799	0.8119	0.5731
7.40	0.6114	0.5827	0.7672	0.5767	0.8211	0.5685
7.50	0.6202	0.5831	0.7763	0.5735	0.8301	0.5639
7.60	0.6288	0.5834	0.7851	0.5700	0.8388	0.5591
7.70	0.6372	0.5836	0.7937	0.5665	0.8472	0.5542
7.80	0.6455	0.5837	0.8020	0.5629	0.8555	0.5493
7.90	0.6536	0.5837	0.8101	0.5592	0.8631	0.5442
8.00	0.6615	0.5836	0.8179	0.5554	0.8706	0.5391
8.10	0.6693	0.5834	0.8255	0.5516	0.8779	0.5340
8.20	0.6770	0.5831	0.8329	0.5476	0.8849	0.5288
8.30	0.6846	0.5827	0.8400	0.5437	0.8917	0.5235
8.40	0.6920	0.5822	0.8470	0.5396	0.8982	0.5182
8.50	0.6993	0.5817	0.8537	0.5355	0.9045	0.5129
8.60	0.7065	0.5810	0.8602	0.5314	0.9105	0.5075
8.70	0.7135	0.5803	0.8666	0.5272	0.9163	0.5023
8.80	0.7205	0.5795	0.8727	0.5231	0.9219	0.4970
8.90	0.7273	0.5786	0.8787	0.5189	0.9272	0.4917
9.00	0.7341	0.5776	0.8844	0.5146	0.9324	0.4865
9.10	0.7408	0.5766	0.8900	0.5104	0.9373	0.4812
9.20	0.7474	0.5755	0.8955	0.5062	0.9421	0.4759
9.30	0.7539	0.5743	0.9007	0.5019	0.9467	0.4707
9.40	0.7603	0.5731	0.9058	0.4977	0.9511	0.4656
9.50	0.7666	0.5718	0.9108	0.4935	0.9553	0.4605
9.60	0.7729	0.5705	0.9156	0.4892	0.9593	0.4554
9.70	0.7790	0.5690	0.9203	0.4850	0.9632	0.4503
9.80	0.7851	0.5676	0.9249	0.4808	0.9670	0.4454
9.90	0.7912	0.5660	0.9292	0.4766	0.9706	0.4404
10.00	0.7972	0.5645	0.9335	0.4725	0.9740	0.4355

	MACH NUMBER 2.50 WIDTH TO LENGTH RATIO 1.0000		MACH NUMBER 2.50 WIDTH TO LENGTH RATIO 2.0000		MACH NUMBER 2.50 WIDTH TO LENGTH RATIO 4.0000	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.10	-16393.0000	0.0198	-8196.4800	0.0208	-4098.2400	0.0213
0.20	-2009.3300	0.0396	-1004.6600	0.0416	-502.3310	0.0426
0.30	-583.5650	0.0593	-291.7810	0.0623	-145.8890	0.0638
0.40	-241.2140	0.0790	-120.6040	0.0830	-60.2995	0.0850
0.50	-120.9500	0.0985	-60.4708	0.1035	-30.2311	0.1060
0.60	-68.5144	0.1180	-34.2510	0.1240	-17.1193	0.1270
0.70	-42.2103	0.1373	-21.0967	0.1443	-10.5399	0.1478
0.80	-27.6467	0.1565	-13.8124	0.1644	-6.8952	0.1684
0.90	-18.9699	0.1755	-9.4711	0.1843	-4.7217	0.1888
1.00	-13.4987	0.1943	-6.7323	0.2041	-3.3491	0.2089
1.10	-9.8893	0.2129	-4.9240	0.2235	-2.4414	0.2289
1.20	-7.4183	0.2313	-3.6847	0.2428	-1.8179	0.2485
1.30	-5.6736	0.2494	-2.8082	0.2617	-1.3755	0.2679
1.40	-4.4091	0.2672	-2.1715	0.2804	-1.0527	0.2869
1.50	-3.4717	0.2847	-1.6981	0.2987	-0.8113	0.3057
1.60	-2.7627	0.3019	-1.3386	0.3167	-0.6265	0.3240
1.70	-2.2171	0.3188	-1.0605	0.3343	-0.4822	0.3420
1.80	-1.7905	0.3354	-0.8416	0.3515	-0.3672	0.3596
1.90	-1.4521	0.3516	-0.6666	0.3684	-0.2739	0.3768
2.00	-1.1803	0.3674	-0.5245	0.3848	-0.1966	0.3935
2.10	-0.9587	0.3828	-0.4076	0.4008	-0.1320	0.4098
2.20	-0.7765	0.3978	-0.3099	0.4164	-0.0766	0.4257
2.30	-0.6248	0.4124	-0.2273	0.4315	-0.0286	0.4411
2.40	-0.4972	0.4266	-0.1566	0.4462	0.0138	0.4559
2.50	-0.3888	0.4403	-0.0952	0.4603	0.0516	0.4703
2.60	-0.2957	0.4536	-0.0413	0.4740	0.0857	0.4842
2.70	-0.2151	0.4665	0.0065	0.4872	0.1173	0.4775
2.80	-0.1447	0.4788	0.0494	0.4998	0.1464	0.5103
2.90	-0.0825	0.4907	0.0883	0.5120	0.1737	0.5226
3.00	-0.0272	0.5021	0.1239	0.5236	0.1995	0.5343
3.10	0.0225	0.5130	0.1568	0.5347	0.2240	0.5455
3.20	0.0674	0.5234	0.1875	0.5452	0.2476	0.5561
3.30	0.1083	0.5334	0.2163	0.5552	0.2703	0.5661
3.40	0.1459	0.5428	0.2435	0.5647	0.2922	0.5756
3.50	0.1806	0.5517	0.2693	0.5736	0.3137	0.5845
3.60	0.2129	0.5601	0.2940	0.5819	0.3346	0.5928
3.70	0.2432	0.5680	0.3177	0.5897	0.3550	0.6005
3.80	0.2717	0.5755	0.3406	0.5970	0.3751	0.6077
3.90	0.2986	0.5824	0.3628	0.6037	0.3949	0.6143
4.00	0.3242	0.5888	0.3843	0.6098	0.4143	0.6203
4.10	0.3486	0.5947	0.4052	0.6154	0.4335	0.6258
4.20	0.3719	0.6001	0.4255	0.6205	0.4523	0.6307
4.30	0.3944	0.6050	0.4455	0.6250	0.4710	0.6350
4.40	0.4160	0.6094	0.4649	0.6290	0.4894	0.6388
4.50	0.4369	0.6133	0.4840	0.6325	0.5075	0.6421
4.60	0.4571	0.6168	0.5027	0.6355	0.5255	0.6448
4.70	0.4767	0.6198	0.5210	0.6379	0.5431	0.6470
4.80	0.4957	0.6224	0.5389	0.6399	0.5606	0.6487
4.90	0.5141	0.6245	0.5566	0.6414	0.5778	0.6499
5.00	0.5321	0.6261	0.5738	0.6424	0.5947	0.6505
5.10	0.5496	0.6273	0.5908	0.6427	0.6114	0.6507
5.20	0.5667	0.6281	0.6074	0.6430	0.6278	0.6504
5.30	0.5833	0.6285	0.6237	0.6426	0.6440	0.6497
5.40	0.5995	0.6285	0.6377	0.6418	0.6598	0.6485
5.50	0.6154	0.6281	0.6554	0.6406	0.6754	0.6467
5.60	0.6308	0.6274	0.6707	0.6390	0.6907	0.6447
5.70	0.6459	0.6262	0.6857	0.6370	0.7057	0.6424
5.80	0.6606	0.6247	0.7004	0.6347	0.7203	0.6396
5.90	0.6749	0.6229	0.7147	0.6319	0.7347	0.6364
6.00	0.6888	0.6208	0.7288	0.6288	0.7487	0.6327
6.10	0.7024	0.6185	0.7424	0.6254	0.7624	0.6290
6.20	0.7157	0.6156	0.7558	0.6217	0.7759	0.6248
6.30	0.7286	0.6125	0.7687	0.6177	0.7888	0.6203
6.40	0.7411	0.6092	0.7814	0.6134	0.8015	0.6155
6.50	0.7533	0.6056	0.7937	0.6088	0.8136	0.6104
6.60	0.7652	0.6018	0.8056	0.6040	0.8256	0.6051
6.70	0.7767	0.5978	0.8172	0.5989	0.8374	0.5995
6.80	0.7879	0.5936	0.8284	0.5937	0.8487	0.5937
6.90	0.7988	0.5891	0.8393	0.5882	0.8596	0.5877
7.00	0.8093	0.5845	0.8499	0.5825	0.8702	0.5815
7.10	0.8195	0.5797	0.8601	0.5767	0.8804	0.5751
7.20	0.8294	0.5747	0.8679	0.5707	0.8902	0.5686
7.30	0.8389	0.5696	0.8774	0.5645	0.8997	0.5620
7.40	0.8481	0.5644	0.8886	0.5583	0.9088	0.5552
7.50	0.8570	0.5591	0.8974	0.5519	0.9176	0.5483
7.60	0.8656	0.5536	0.9059	0.5454	0.9260	0.5413
7.70	0.8739	0.5481	0.9140	0.5388	0.9341	0.5342
7.80	0.8819	0.5424	0.9219	0.5322	0.9418	0.5271
7.90	0.8896	0.5367	0.9294	0.5255	0.9492	0.5199
8.00	0.8970	0.5310	0.9365	0.5187	0.9563	0.5126
8.10	0.9041	0.5252	0.9434	0.5120	0.9631	0.5054
8.20	0.9107	0.5193	0.9500	0.5052	0.9695	0.4981
8.30	0.9175	0.5134	0.9562	0.4983	0.9756	0.4908
8.40	0.9238	0.5076	0.9622	0.4915	0.9814	0.4835
8.50	0.9298	0.5017	0.9679	0.4847	0.9869	0.4763
8.60	0.9356	0.4958	0.9733	0.4779	0.9921	0.4690
8.70	0.9412	0.4899	0.9784	0.0000	0.9971	0.4619
8.80	0.9465	0.4840	0.9833	0.4645	1.0018	0.4547
8.90	0.9515	0.4782	0.9880	0.4578	1.0062	0.4476
9.00	0.9564	0.4723	0.9923	0.4512	1.0103	0.4406
9.10	0.9610	0.4666	0.9965	0.4447	1.0142	0.4337
9.20	0.9654	0.4608	1.0004	0.4382	1.0177	0.4268
9.30	0.9696	0.4552	1.0041	0.4318	1.0213	0.4201
9.40	0.9737	0.4495	1.0076	0.4254	1.0246	0.4134
9.50	0.9775	0.4440	1.0109	0.4192	1.0276	0.4068
9.60	0.9812	0.4384	1.0140	0.4130	1.0304	0.4003
9.70	0.9847	0.4330	1.0169	0.4070	1.0330	0.3940
9.80	0.9880	0.4276	1.0177	0.4010	1.0355	0.3877
9.90	0.9912	0.4223	1.0222	0.3951	1.0377	0.3816
10.00	0.9943	0.4171	1.0247	0.3894	1.0399	0.3755

	MACH NUMBER 3.00 WIDTH TO LENGTH RATIO 0.2500		MACH NUMBER 3.00 WIDTH TO LENGTH RATIO 0.5000		MACH NUMBER 3.00 WIDTH TO LENGTH RATIO 0.7500	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.10	-120703.0000	0.0124	-60351.5996	0.0150	-40234.3999	0.0159
0.20	-14896.8999	0.0248	-7448.4500	0.0300	-4965.6299	0.0318
0.30	-4357.3100	0.0372	-2178.6500	0.0450	-1452.4300	0.0477
0.40	-1814.3600	0.0496	-907.1800	0.0600	-604.7860	0.0635
0.50	-916.7290	0.0620	-458.3620	0.0749	-305.5730	0.0793
0.60	-523.4390	0.0743	-261.7150	0.0898	-174.4740	0.0951
0.70	-325.1710	0.0866	-162.5800	0.1046	-108.3830	0.1107
0.80	-214.8510	0.0988	-107.4190	0.1194	-71.6078	0.1264
0.90	-148.7970	0.1110	-74.3895	0.1341	-49.5871	0.1419
1.00	-106.9400	0.1232	-53.4591	0.1487	-35.6321	0.1573
1.10	-79.1920	0.1353	-39.5829	0.1632	-26.3798	0.1726
1.20	-60.1076	0.1473	-30.0382	0.1775	-20.0150	0.1878
1.30	-46.5741	0.1592	-23.2688	0.1918	-15.5002	0.2029
1.40	-36.7257	0.1711	-18.3417	0.2060	-12.2136	0.2178
1.50	-29.3987	0.1828	-14.6751	0.2200	-9.7671	0.2326
1.60	-23.8422	0.1945	-11.8936	0.2339	-7.9106	0.2473
1.70	-19.5574	0.2061	-9.7477	0.2477	-6.4777	0.2618
1.80	-16.2039	0.2176	-8.0673	0.2613	-5.3550	0.2761
1.90	-13.5447	0.2290	-6.7339	0.2747	-4.4635	0.2902
2.00	-11.4112	0.2402	-5.6631	0.2879	-3.7469	0.3041
2.10	-9.6811	0.2514	-4.7949	0.3010	-3.1646	0.3178
2.20	-8.2647	0.2624	-4.0813	0.3139	-2.6866	0.3314
2.30	-7.0949	0.2733	-3.4919	0.3266	-2.2906	0.3447
2.40	-6.1210	0.2840	-3.0002	0.3391	-1.9597	0.3578
2.50	-5.3045	0.2947	-2.5870	0.3514	-1.6809	0.3706
2.60	-4.6146	0.3051	-2.2371	0.3635	-1.4443	0.3832
2.70	-4.0285	0.3155	-1.9389	0.3753	-1.2420	0.3956
2.80	-3.5275	0.3257	-1.6831	0.3870	-1.0679	0.4077
2.90	-3.0969	0.3357	-1.4623	0.3984	-0.9170	0.4196
3.00	-2.7249	0.3456	-1.2707	0.4095	-0.7855	0.4311
3.10	-2.4019	0.3553	-1.1034	0.4205	-0.6702	0.4425
3.20	-2.1201	0.3648	-0.9567	0.4311	-0.5684	0.4535
3.30	-1.8733	0.3742	-0.8273	0.4415	-0.4781	0.4643
3.40	-1.6561	0.3834	-0.7126	0.4517	-0.3976	0.4747
3.50	-1.4642	0.3925	-0.6104	0.4616	-0.3253	0.4849
3.60	-1.2941	0.4013	-0.5191	0.4712	-0.2602	0.4948
3.70	-1.1427	0.4100	-0.4369	0.4806	-0.2011	0.5044
3.80	-1.0074	0.4185	-0.3628	0.4897	-0.1473	0.5137
3.90	-0.8862	0.4268	-0.2956	0.4985	-0.0981	0.5226
4.00	-0.7772	0.4349	-0.2344	0.5071	-0.0528	0.5313
4.10	-0.6788	0.4429	-0.1784	0.5153	-0.0110	0.5396
4.20	-0.5897	0.4506	-0.1270	0.5233	0.0279	0.5477
4.30	-0.5088	0.4582	-0.0797	0.5310	0.0640	0.5554
4.40	-0.4351	0.4655	-0.0359	0.5384	0.0979	0.5628
4.50	-0.3678	0.4727	0.0048	0.5455	0.1297	0.5698
4.60	-0.3063	0.4796	0.0427	0.5523	0.1597	0.5766
4.70	-0.2494	0.4864	0.0781	0.5588	0.1881	0.5830
4.80	-0.1972	0.4930	0.1114	0.5651	0.2150	0.5891
4.90	-0.1489	0.4993	0.1427	0.5710	0.2407	0.5949
5.00	-0.1041	0.5055	0.1722	0.5767	0.2652	0.6004
5.10	-0.0625	0.5115	0.2002	0.5820	0.2887	0.6055
5.20	-0.0238	0.5172	0.2268	0.5871	0.3112	0.6103
5.30	0.0124	0.5228	0.2521	0.5919	0.3329	0.6148
5.40	0.0463	0.5282	0.2763	0.5964	0.3539	0.6190
5.50	0.0781	0.5333	0.2994	0.6006	0.3741	0.6228
5.60	0.1080	0.5383	0.3216	0.6045	0.3937	0.6264
5.70	0.1362	0.5431	0.3429	0.6082	0.4127	0.6296
5.80	0.1629	0.5477	0.3634	0.6115	0.4311	0.6325
5.90	0.1881	0.5520	0.3832	0.6146	0.4491	0.6351
6.00	0.2121	0.5562	0.4023	0.6174	0.4666	0.6374
6.10	0.2349	0.5602	0.4208	0.6199	0.4836	0.6394
6.20	0.2567	0.5640	0.4387	0.6221	0.5003	0.6411
6.30	0.2775	0.5676	0.4561	0.6241	0.5165	0.6425
6.40	0.2973	0.5710	0.4729	0.6258	0.5324	0.6436
6.50	0.3164	0.5743	0.4873	0.6273	0.5479	0.6444
6.60	0.3347	0.5773	0.5053	0.6285	0.5631	0.6449
6.70	0.3522	0.5802	0.5208	0.6294	0.5779	0.6452
6.80	0.3691	0.5828	0.5360	0.6301	0.5925	0.6452
6.90	0.3855	0.5853	0.5508	0.6306	0.6067	0.6449
7.00	0.4012	0.5877	0.5652	0.6308	0.6207	0.6444
7.10	0.4164	0.5898	0.5792	0.6307	0.6344	0.6436
7.20	0.4312	0.5918	0.5930	0.6305	0.6478	0.6426
7.30	0.4455	0.5936	0.6064	0.6300	0.6609	0.6413
7.40	0.4593	0.5952	0.6195	0.6293	0.6738	0.6397
7.50	0.4728	0.5967	0.6324	0.6283	0.6863	0.6380
7.60	0.4858	0.5980	0.6449	0.6272	0.6987	0.6360
7.70	0.4985	0.5991	0.6572	0.6259	0.7108	0.6338
7.80	0.5109	0.6001	0.6671	0.6243	0.7226	0.6314
7.90	0.5230	0.6010	0.6809	0.6226	0.7342	0.6287
8.00	0.5347	0.6017	0.6923	0.6207	0.7455	0.6259
8.10	0.5462	0.6022	0.7035	0.6186	0.7566	0.6229
8.20	0.5574	0.6026	0.7145	0.6163	0.7674	0.6197
8.30	0.5683	0.6029	0.7252	0.6138	0.7780	0.6163
8.40	0.5789	0.6030	0.7356	0.6112	0.7884	0.6127
8.50	0.5894	0.6030	0.7459	0.6085	0.7985	0.6090
8.60	0.5996	0.6029	0.7558	0.6055	0.8084	0.6051
8.70	0.6095	0.6026	0.7656	0.6025	0.8180	0.6011
8.80	0.6193	0.6022	0.7751	0.5992	0.8274	0.5969
8.90	0.6289	0.6017	0.7844	0.5959	0.8366	0.5926
9.00	0.6382	0.6011	0.7935	0.5924	0.8456	0.5881
9.10	0.6474	0.6004	0.8023	0.5888	0.8543	0.5835
9.20	0.6563	0.5995	0.8110	0.5851	0.8627	0.5789
9.30	0.6651	0.5986	0.8194	0.5813	0.8710	0.5741
9.40	0.6737	0.5975	0.8276	0.5774	0.8790	0.5692
9.50	0.6822	0.5964	0.8356	0.5733	0.8868	0.5642
9.60	0.6904	0.5951	0.8433	0.5692	0.8943	0.5591
9.70	0.6985	0.5938	0.8507	0.5650	0.9017	0.5539
9.80	0.7065	0.5923	0.8583	0.5607	0.9088	0.5486
9.90	0.7143	0.5908	0.8654	0.5564	0.9157	0.5433
10.00	0.7219	0.5892	0.8724	0.5519	0.9224	0.5379

	MACH NUMBER 3.00 WIDTH TO LENGTH RATIO 1.0000		MACH NUMBER 3.00 WIDTH TO LENGTH RATIO 2.0000		MACH NUMBER 3.00 WIDTH TO LENGTH RATIO 4.0000	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.10	-30175.7998	0.0164	-15087.8999	0.0170	-7543.9399	0.0173
0.20	-3724.2200	0.0327	-1862.1100	0.0340	-931.0560	0.0347
0.30	-1089.3300	0.0490	-544.6620	0.0510	-272.3300	0.0520
0.40	-453.5880	0.0653	-226.7920	0.0679	-113.3940	0.0692
0.50	-229.1700	0.0815	-114.5860	0.0848	-57.2904	0.0865
0.60	-130.8540	0.0977	-65.4229	0.1016	-32.7075	0.1036
0.70	-81.2847	0.1138	-40.6370	0.1184	-20.3131	0.1207
0.80	-53.7023	0.1298	-26.8441	0.1351	-13.4150	0.1377
0.90	-37.1859	0.1458	-18.5840	0.1516	-9.2831	0.1546
1.00	-26.7186	0.1616	-13.3483	0.1681	-6.6632	0.1714
1.10	-19.7782	0.1774	-9.8759	0.1845	-4.9247	0.1880
1.20	-15.0034	0.1930	-7.4860	0.2007	-3.7273	0.2045
1.30	-11.6160	0.2084	-5.7896	0.2167	-2.8764	0.2209
1.40	-9.1495	0.2238	-4.5534	0.2327	-2.2554	0.2371
1.50	-7.3131	0.2390	-3.6322	0.2484	-1.7917	0.2533
1.60	-5.9191	0.2540	-2.9319	0.2640	-1.4382	0.2690
1.70	-4.8427	0.2688	-2.3902	0.2794	-1.1639	0.2847
1.80	-3.9980	0.2835	-1.9645	0.2946	-0.9474	0.3001
1.90	-3.3282	0.2979	-1.6254	0.3096	-0.7740	0.3154
2.00	-2.7888	0.3122	-1.3516	0.3243	-0.6330	0.3304
2.10	-2.3499	0.3263	-1.1269	0.3389	-0.5170	0.3452
2.20	-1.9893	0.3401	-0.9432	0.3532	-0.4202	0.3597
2.30	-1.6900	0.3537	-0.7890	0.3673	-0.3385	0.3740
2.40	-1.4394	0.3671	-0.6590	0.3811	-0.2688	0.3881
2.50	-1.2279	0.3802	-0.5483	0.3946	-0.2086	0.4018
2.60	-1.0479	0.3931	-0.4533	0.4079	-0.1560	0.4153
2.70	-0.8936	0.4057	-0.3709	0.4209	-0.1096	0.4285
2.80	-0.7603	0.4181	-0.2989	0.4336	-0.0682	0.4414
2.90	-0.6444	0.4301	-0.2355	0.4460	-0.0310	0.4540
3.00	-0.5429	0.4419	-0.1791	0.4581	0.0028	0.4662
3.10	-0.4536	0.4535	-0.1286	0.4700	0.0339	0.4782
3.20	-0.3743	0.4647	-0.0831	0.4815	0.0625	0.4898
3.30	-0.3036	0.4756	-0.0417	0.4926	0.0892	0.5012
3.40	-0.2401	0.4862	-0.0038	0.5035	0.1143	0.5121
3.50	-0.1827	0.4966	0.0311	0.5140	0.1380	0.5228
3.60	-0.1307	0.5066	0.0635	0.5242	0.1606	0.5330
3.70	-0.0832	0.5163	0.0937	0.5341	0.1821	0.5430
3.80	-0.0396	0.5256	0.1220	0.5436	0.2029	0.5526
3.90	0.0007	0.5347	0.1488	0.5527	0.2229	0.5618
4.00	0.0380	0.5434	0.1742	0.5616	0.2423	0.5706
4.10	0.0728	0.5518	0.1984	0.5700	0.2612	0.5791
4.20	0.1053	0.5599	0.2215	0.5781	0.2796	0.5873
4.30	0.1359	0.5676	0.2437	0.5859	0.2976	0.5950
4.40	0.1648	0.5750	0.2651	0.5933	0.3153	0.6024
4.50	0.1922	0.5820	0.2859	0.6003	0.3327	0.6094
4.60	0.2182	0.5887	0.3060	0.6070	0.3497	0.6161
4.70	0.2431	0.5951	0.3255	0.6133	0.3666	0.6223
4.80	0.2668	0.6012	0.3446	0.6192	0.3834	0.6282
4.90	0.2897	0.6068	0.3632	0.6248	0.3999	0.6337
5.00	0.3117	0.6122	0.3814	0.6300	0.4162	0.6388
5.10	0.3327	0.6172	0.3992	0.6348	0.4324	0.6436
5.20	0.3534	0.6219	0.4167	0.6393	0.4484	0.6480
5.30	0.3735	0.6263	0.4339	0.6434	0.4642	0.6520
5.40	0.3976	0.6303	0.4508	0.6472	0.4799	0.6557
5.50	0.4114	0.6339	0.4676	0.6506	0.4954	0.6589
5.60	0.4297	0.6373	0.4838	0.6537	0.5108	0.6618
5.70	0.4476	0.6403	0.4999	0.6564	0.5261	0.6644
5.80	0.4650	0.6430	0.5158	0.6587	0.5412	0.6666
5.90	0.4821	0.6453	0.5315	0.6607	0.5562	0.6684
6.00	0.4987	0.6474	0.5470	0.6624	0.5711	0.6699
6.10	0.5151	0.6491	0.5622	0.6637	0.5858	0.6711
6.20	0.5310	0.6505	0.5772	0.6647	0.6003	0.6718
6.30	0.5467	0.6517	0.5921	0.6655	0.6147	0.6723
6.40	0.5621	0.6525	0.6067	0.6658	0.6290	0.6724
6.50	0.5772	0.6530	0.6211	0.6658	0.6431	0.6722
6.60	0.5920	0.6532	0.6353	0.6655	0.6570	0.6717
6.70	0.6065	0.6531	0.6493	0.6650	0.6707	0.6709
6.80	0.6207	0.6527	0.6631	0.6641	0.6843	0.6697
6.90	0.6347	0.6521	0.6767	0.6629	0.6977	0.6683
7.00	0.6485	0.6512	0.6901	0.6614	0.7109	0.6665
7.10	0.6619	0.6500	0.7033	0.6597	0.7239	0.6645
7.20	0.6752	0.6486	0.7162	0.6577	0.7368	0.6622
7.30	0.6881	0.6469	0.7290	0.6554	0.7494	0.6596
7.40	0.7009	0.6450	0.7415	0.6528	0.7618	0.6567
7.50	0.7133	0.6428	0.7538	0.6500	0.7741	0.6536
7.60	0.7256	0.6404	0.7659	0.6470	0.7861	0.6502
7.70	0.7376	0.6377	0.7778	0.6437	0.7979	0.6466
7.80	0.7493	0.6349	0.7894	0.6401	0.8095	0.6428
7.90	0.7608	0.6318	0.8008	0.6364	0.8208	0.6387
8.00	0.7721	0.6285	0.8120	0.6324	0.8320	0.6344
8.10	0.7831	0.6250	0.8230	0.6283	0.8427	0.6299
8.20	0.7939	0.6214	0.8337	0.6239	0.8535	0.6252
8.30	0.8045	0.6175	0.8441	0.6193	0.8640	0.6203
8.40	0.8148	0.6135	0.8544	0.6146	0.8741	0.6152
8.50	0.8249	0.6093	0.8643	0.6097	0.8841	0.6099
8.60	0.8347	0.6049	0.8741	0.6046	0.8939	0.6044
8.70	0.8443	0.6004	0.8836	0.5993	0.9033	0.5988
8.80	0.8536	0.5957	0.8929	0.5940	0.9125	0.5931
8.90	0.8627	0.5909	0.9019	0.5884	0.9214	0.5872
9.00	0.8716	0.5860	0.9106	0.5827	0.9302	0.5811
9.10	0.8802	0.5809	0.9192	0.5770	0.9386	0.5750
9.20	0.8886	0.5757	0.9274	0.5710	0.9468	0.5687
9.30	0.8968	0.5704	0.9355	0.5650	0.9548	0.5623
9.40	0.9047	0.5650	0.9433	0.5589	0.9625	0.5558
9.50	0.9124	0.5596	0.9508	0.5527	0.9700	0.5492
9.60	0.9198	0.5540	0.9581	0.5464	0.9772	0.5426
9.70	0.9271	0.5483	0.9651	0.5400	0.9842	0.5358
9.80	0.9341	0.5426	0.9719	0.5335	0.9909	0.5290
9.90	0.9408	0.5368	0.9785	0.5270	0.9974	0.5221
10.00	0.9474	0.5310	0.9848	0.5205	1.0036	0.5152

GENERALIZED FREQUENCY	MACH NUMBER 3.50 WIDTH TO LENGTH RATIO 0.2500 RADIATION RESISTANCE	RADIATION REACTANCE	MACH NUMBER 3.50 WIDTH TO LENGTH RATIO 0.5000 RADIATION RESISTANCE	RADIATION REACTANCE	MACH NUMBER 3.50 WIDTH TO LENGTH RATIO 0.7500 RADIATION RESISTANCE	RADIATION REACTANCE
0.10	-198753.0000	0.0111	-99376.2998	0.0130	-66250.8994	0.0137
0.20	-24621.2998	0.0223	-12310.6000	0.0260	-8207.0900	0.0273
0.30	-7229.1700	0.0334	-3614.5800	0.0390	-2409.7200	0.0409
0.40	-3021.9500	0.0445	-1510.9800	0.0520	-1007.3200	0.0545
0.50	-1532.9800	0.0556	-766.4870	0.0650	-510.9900	0.0681
0.60	-878.8860	0.0667	-439.4400	0.0779	-292.9580	0.0817
0.70	-548.2680	0.0777	-274.1300	0.0908	-182.7510	0.0952
0.80	-363.8120	0.0888	-181.9010	0.1037	-121.2640	0.1087
0.90	-253.0680	0.0997	-126.5280	0.1165	-84.3478	0.1221
1.00	-182.7000	0.1107	-91.3425	0.1292	-60.8899	0.1354
1.10	-135.9220	0.1216	-67.9516	0.1419	-45.2949	0.1487
1.20	-103.6580	0.1325	-51.8180	0.1546	-34.5380	0.1620
1.30	-80.7132	0.1433	-40.3437	0.1672	-26.8871	0.1751
1.40	-63.9681	0.1541	-31.9691	0.1796	-21.3027	0.1882
1.50	-51.4741	0.1648	-25.7199	0.1921	-17.1351	0.2012
1.60	-41.9715	0.1754	-20.9662	0.2044	-13.9645	0.2141
1.70	-34.6219	0.1860	-17.2890	0.2166	-11.5113	0.2269
1.80	-28.8530	0.1965	-14.4019	0.2288	-9.5849	0.2396
1.90	-24.2649	0.2070	-12.1051	0.2408	-8.0518	0.2521
2.00	-20.5728	0.2173	-10.2562	0.2528	-6.8173	0.2646
2.10	-17.5702	0.2276	-8.7510	0.2646	-5.8124	0.2770
2.20	-15.1047	0.2378	-7.5159	0.2763	-4.9863	0.2892
2.30	-13.0627	0.2479	-6.4916	0.2879	-4.3013	0.3013
2.40	-11.3577	0.2580	-5.6357	0.2994	-3.7284	0.3132
2.50	-9.9238	0.2679	-4.9152	0.3107	-3.2457	0.3250
2.60	-8.7097	0.2778	-4.3045	0.3219	-2.8361	0.3367
2.70	-7.6753	0.2875	-3.7835	0.3330	-2.4862	0.3482
2.80	-6.7888	0.2971	-3.3364	0.3439	-2.1855	0.3595
2.90	-6.0250	0.3067	-2.9505	0.3547	-1.9256	0.3707
3.00	-5.3636	0.3161	-2.6156	0.3653	-1.6996	0.3817
3.10	-4.7881	0.3254	-2.3236	0.3758	-1.5021	0.3926
3.20	-4.2852	0.3346	-2.0678	0.3861	-1.3286	0.4032
3.30	-3.8437	0.3437	-1.8426	0.3962	-1.1755	0.4137
3.40	-3.4547	0.3526	-1.6435	0.4062	-1.0397	0.4240
3.50	-3.1107	0.3615	-1.4668	0.4160	-0.9180	0.4342
3.60	-2.8053	0.3702	-1.3093	0.4256	-0.8106	0.4441
3.70	-2.5333	0.3788	-1.1684	0.4351	-0.7135	0.4538
3.80	-2.2901	0.3872	-1.0419	0.4443	-0.6258	0.4634
3.90	-2.0722	0.3955	-0.9279	0.4534	-0.5464	0.4727
4.00	-1.8762	0.4037	-0.8248	0.4623	-0.4742	0.4819
4.10	-1.6995	0.4118	-0.7312	0.4710	-0.4084	0.4908
4.20	-1.5396	0.4197	-0.6460	0.4795	-0.3480	0.4995
4.30	-1.3946	0.4274	-0.5681	0.4879	-0.2925	0.5080
4.40	-1.2628	0.4351	-0.4967	0.4960	-0.2413	0.5163
4.50	-1.1427	0.4425	-0.4311	0.5039	-0.1939	0.5244
4.60	-1.0329	0.4499	-0.3707	0.5116	-0.1499	0.5322
4.70	-0.9323	0.4571	-0.3147	0.5191	-0.1088	0.5398
4.80	-0.8399	0.4641	-0.2628	0.5265	-0.0704	0.5472
4.90	-0.7550	0.4710	-0.2145	0.5336	-0.0345	0.5545
5.00	-0.6764	0.4777	-0.1695	0.5404	-0.0004	0.5614
5.10	-0.6038	0.4843	-0.1273	0.5471	0.0316	0.5681
5.20	-0.5366	0.4907	-0.0878	0.5536	0.0619	0.5746
5.30	-0.4742	0.4970	-0.0506	0.5599	0.0906	0.5808
5.40	-0.4161	0.5031	-0.0156	0.5659	0.1180	0.5868
5.50	-0.3619	0.5090	0.0175	0.5717	0.1441	0.5926
5.60	-0.3113	0.5148	0.0489	0.5773	0.1690	0.5982
5.70	-0.2639	0.5205	0.0787	0.5827	0.1930	0.6035
5.80	-0.2194	0.5259	0.1071	0.5879	0.2160	0.6086
5.90	-0.1776	0.5312	0.1341	0.5929	0.2381	0.6134
6.00	-0.1383	0.5364	0.1599	0.5976	0.2594	0.6180
6.10	-0.1011	0.5414	0.1847	0.6021	0.2800	0.6224
6.20	-0.0660	0.5462	0.2084	0.6065	0.3000	0.6265
6.30	-0.0328	0.5509	0.2312	0.6105	0.3193	0.6304
6.40	-0.0013	0.5554	0.2532	0.6144	0.3381	0.6341
6.50	0.0287	0.5597	0.2744	0.6181	0.3564	0.6375
6.60	0.0572	0.5639	0.2949	0.6215	0.3742	0.6407
6.70	0.0844	0.5679	0.3146	0.6247	0.3915	0.6436
6.80	0.1103	0.5718	0.3338	0.6278	0.4084	0.6464
6.90	0.1351	0.5755	0.3524	0.6306	0.4249	0.6489
7.00	0.1589	0.5790	0.3704	0.6331	0.4410	0.6511
7.10	0.1817	0.5824	0.3880	0.6355	0.4568	0.6532
7.20	0.2036	0.5856	0.4050	0.6377	0.4723	0.6550
7.30	0.2246	0.5887	0.4217	0.6396	0.4874	0.6566
7.40	0.2448	0.5916	0.4379	0.6414	0.5023	0.6579
7.50	0.2644	0.5944	0.4537	0.6429	0.5169	0.6591
7.60	0.2832	0.5970	0.4691	0.6443	0.5312	0.6600
7.70	0.3014	0.5994	0.4842	0.6454	0.5452	0.6607
7.80	0.3190	0.6017	0.4989	0.6464	0.5590	0.6612
7.90	0.3360	0.6039	0.5134	0.6471	0.5726	0.6615
8.00	0.3526	0.6058	0.5275	0.6477	0.5859	0.6616
8.10	0.3686	0.6077	0.5413	0.6480	0.5990	0.6614
8.20	0.3841	0.6094	0.5548	0.6482	0.6118	0.6611
8.30	0.3993	0.6109	0.5681	0.6482	0.6245	0.6605
8.40	0.4140	0.6123	0.5811	0.6480	0.6369	0.6598
8.50	0.4283	0.6136	0.5939	0.6476	0.6492	0.6589
8.60	0.4422	0.6147	0.6064	0.6471	0.6612	0.6578
8.70	0.4558	0.6157	0.6187	0.6463	0.6730	0.6565
8.80	0.4690	0.6165	0.6307	0.6454	0.6847	0.6550
8.90	0.4820	0.6172	0.6425	0.6444	0.6961	0.6533
9.00	0.4946	0.6178	0.6541	0.6431	0.7074	0.6515
9.10	0.5069	0.6183	0.6655	0.6417	0.7184	0.6494
9.20	0.5190	0.6186	0.6767	0.6402	0.7293	0.6472
9.30	0.5307	0.6187	0.6876	0.6384	0.7400	0.6449
9.40	0.5423	0.6188	0.6984	0.6366	0.7505	0.6424
9.50	0.5535	0.6187	0.7089	0.6345	0.7608	0.6397
9.60	0.5646	0.6185	0.7193	0.6324	0.7707	0.6369
9.70	0.5754	0.6182	0.7295	0.6301	0.7807	0.6339
9.80	0.5860	0.6178	0.7394	0.6276	0.7906	0.6308
9.90	0.5963	0.6173	0.7492	0.6250	0.8002	0.6275
10.00	0.6065	0.6166	0.7588	0.6223	0.8096	0.6241

GENERALIZED FREQUENCY	MACH NUMBER 3.50 WIDTH TO LENGTH RATIO 1.0000 RADIATION RESISTANCE	MACH NUMBER 3.50 WIDTH TO LENGTH RATIO 1.0000 RADIATION REACTANCE	MACH NUMBER 3.50 WIDTH TO LENGTH RATIO 2.0000 RADIATION RESISTANCE	MACH NUMBER 3.50 WIDTH TO LENGTH RATIO 2.0000 RADIATION REACTANCE	MACH NUMBER 3.50 WIDTH TO LENGTH RATIO 4.0000 RADIATION RESISTANCE	MACH NUMBER 3.50 WIDTH TO LENGTH RATIO 4.0000 RADIATION REACTANCE
0.10	-49688.1997	0.0140	-24844.0999	0.0144	-12422.0000	0.0147
0.20	-6155.3199	0.0279	-3077.6600	0.0289	-1538.8500	0.0293
0.30	-1807.2900	0.0419	-903.6450	0.0433	-451.8220	0.0440
0.40	-755.4860	0.0558	-377.7420	0.0577	-188.8700	0.0586
0.50	-383.2420	0.0697	-191.6190	0.0720	-95.8075	0.0732
0.60	-219.7170	0.0835	-109.8560	0.0864	-54.9251	0.0878
0.70	-137.0610	0.0974	-68.5269	0.1006	-34.2597	0.1023
0.80	-90.9456	0.1111	-45.4679	0.1149	-22.7290	0.1167
0.90	-63.2577	0.1249	-31.6226	0.1291	-15.8051	0.1312
1.00	-45.6636	0.1385	-22.8241	0.1432	-11.4044	0.1455
1.10	-33.9665	0.1521	-16.9740	0.1572	-8.4777	0.1598
1.20	-25.8979	0.1657	-12.9379	0.1712	-6.4579	0.1740
1.30	-20.1589	0.1791	-10.0665	0.1851	-5.0203	0.1881
1.40	-15.9696	0.1925	-7.9698	0.1989	-3.9699	0.2021
1.50	-12.8428	0.2057	-6.4042	0.2126	-3.1849	0.2160
1.60	-10.4636	0.2189	-5.2123	0.2262	-2.5866	0.2298
1.70	-8.6225	0.2320	-4.2893	0.2397	-2.1226	0.2435
1.80	-7.1763	0.2450	-3.5636	0.2530	-1.7572	0.2571
1.90	-6.0252	0.2578	-2.9852	0.2663	-1.4653	0.2705
2.00	-5.0978	0.2705	-2.5187	0.2794	-1.2291	0.2838
2.10	-4.3426	0.2831	-2.1380	0.2924	-1.0357	0.2970
2.20	-3.7215	0.2956	-1.8243	0.3052	-0.8757	0.3101
2.30	-3.2061	0.3079	-1.5633	0.3179	-0.7419	0.3229
2.40	-2.7747	0.3201	-1.3442	0.3305	-0.6290	0.3357
2.50	-2.4109	0.3321	-1.1588	0.3429	-0.5327	0.3482
2.60	-2.1019	0.3440	-1.0006	0.3551	-0.4499	0.3606
2.70	-1.8376	0.3558	-0.8646	0.3672	-0.3782	0.3728
2.80	-1.6101	0.3673	-0.7470	0.3790	-0.3154	0.3849
2.90	-1.4131	0.3787	-0.6445	0.3907	-0.2601	0.3967
3.00	-1.2415	0.3899	-0.5545	0.4023	-0.2110	0.4084
3.10	-1.0913	0.4010	-0.4751	0.4136	-0.1671	0.4199
3.20	-0.9590	0.4118	-0.4046	0.4247	-0.1274	0.4312
3.30	-0.8419	0.4225	-0.3416	0.4357	-0.0915	0.4422
3.40	-0.7378	0.4330	-0.2850	0.4464	-0.0586	0.4531
3.50	-0.6448	0.4433	-0.2338	0.4569	-0.0283	0.4637
3.60	-0.5613	0.4534	-0.1873	0.4672	-0.0002	0.4742
3.70	-0.4860	0.4632	-0.1447	0.4773	0.0257	0.4844
3.80	-0.4177	0.4729	-0.1057	0.4872	0.0504	0.4944
3.90	-0.3557	0.4824	-0.0696	0.4969	0.0735	0.5041
4.00	-0.2990	0.4916	-0.0361	0.5063	0.0954	0.5136
4.10	-0.2470	0.5007	-0.0048	0.5155	0.1162	0.5229
4.20	-0.1990	0.5095	0.0244	0.5245	0.1361	0.5320
4.30	-0.1547	0.5181	0.0519	0.5332	0.1555	0.5408
4.40	-0.1136	0.5265	0.0780	0.5417	0.1737	0.5493
4.50	-0.0753	0.5346	0.1026	0.5500	0.1916	0.5576
4.60	-0.0395	0.5425	0.1261	0.5580	0.2089	0.5657
4.70	-0.0058	0.5502	0.1486	0.5657	0.2255	0.5735
4.80	0.0258	0.5576	0.1702	0.5732	0.2423	0.5810
4.90	0.0557	0.5649	0.1907	0.5805	0.2584	0.5883
5.00	0.0841	0.5718	0.2109	0.5875	0.2743	0.5954
5.10	0.1110	0.5786	0.2302	0.5943	0.2898	0.6021
5.20	0.1367	0.5851	0.2490	0.6008	0.3051	0.6086
5.30	0.1613	0.5913	0.2672	0.6070	0.3202	0.6149
5.40	0.1848	0.5973	0.2850	0.6130	0.3351	0.6209
5.50	0.2074	0.6031	0.3023	0.6187	0.3498	0.6266
5.60	0.2291	0.6086	0.3192	0.6242	0.3643	0.6320
5.70	0.2501	0.6139	0.3358	0.6294	0.3787	0.6372
5.80	0.2704	0.6189	0.3521	0.6344	0.3929	0.6421
5.90	0.2901	0.6237	0.3681	0.6391	0.4071	0.6468
6.00	0.3092	0.6282	0.3838	0.6435	0.4211	0.6512
6.10	0.3277	0.6325	0.3992	0.6477	0.4350	0.6553
6.20	0.3458	0.6365	0.4145	0.6516	0.4488	0.6591
6.30	0.3634	0.6403	0.4295	0.6552	0.4625	0.6627
6.40	0.3806	0.6439	0.4443	0.6586	0.4761	0.6660
6.50	0.3974	0.6472	0.4589	0.6618	0.4896	0.6691
6.60	0.4138	0.6503	0.4733	0.6646	0.5030	0.6718
6.70	0.4299	0.6531	0.4875	0.6673	0.5164	0.6744
6.80	0.4457	0.6557	0.5016	0.6696	0.5296	0.6766
6.90	0.4612	0.6580	0.5155	0.6718	0.5427	0.6786
7.00	0.4763	0.6601	0.5293	0.6736	0.5558	0.6804
7.10	0.4913	0.6620	0.5429	0.6752	0.5687	0.6818
7.20	0.5059	0.6636	0.5564	0.6766	0.5816	0.6831
7.30	0.5203	0.6650	0.5697	0.6777	0.5943	0.6841
7.40	0.5345	0.6662	0.5828	0.6786	0.6070	0.6848
7.50	0.5485	0.6671	0.5959	0.6792	0.6196	0.6853
7.60	0.5622	0.6678	0.6087	0.6796	0.6320	0.6855
7.70	0.5757	0.6683	0.6215	0.6798	0.6444	0.6855
7.80	0.5890	0.6686	0.6341	0.6797	0.6566	0.6853
7.90	0.6021	0.6687	0.6465	0.6794	0.6687	0.6848
8.00	0.6151	0.6685	0.6589	0.6789	0.6808	0.6841
8.10	0.6278	0.6681	0.6710	0.6781	0.6926	0.6831
8.20	0.6403	0.6675	0.6831	0.6772	0.7044	0.6820
8.30	0.6527	0.6667	0.6949	0.6760	0.7161	0.6806
8.40	0.6648	0.6657	0.7067	0.6746	0.7276	0.6790
8.50	0.6768	0.6645	0.7183	0.6730	0.7390	0.6772
8.60	0.6886	0.6631	0.7297	0.6711	0.7502	0.6751
8.70	0.7002	0.6615	0.7410	0.6691	0.7614	0.6727
8.80	0.7116	0.6597	0.7521	0.6669	0.7723	0.6705
8.90	0.7229	0.6578	0.7631	0.6645	0.7832	0.6678
9.00	0.7340	0.6556	0.7739	0.6619	0.7939	0.6650
9.10	0.7449	0.6533	0.7846	0.6591	0.8044	0.6620
9.20	0.7556	0.6508	0.7951	0.6561	0.8148	0.6588
9.30	0.7661	0.6481	0.8054	0.6529	0.8250	0.6554
9.40	0.7765	0.6453	0.8156	0.6496	0.8351	0.6518
9.50	0.7867	0.6423	0.8256	0.6461	0.8450	0.6481
9.60	0.7967	0.6391	0.8354	0.6425	0.8548	0.6442
9.70	0.8066	0.6358	0.8451	0.6387	0.8644	0.6401
9.80	0.8162	0.6323	0.8546	0.6347	0.8738	0.6359
9.90	0.8257	0.6287	0.8640	0.6306	0.8831	0.6315
10.00	0.8350	0.6250	0.8731	0.6263	0.8922	0.6270

	MACH NUMBER 4.00 WIDTH TO LENGTH RATIO 0.2500		MACH NUMBER 4.00 WIDTH TO LENGTH RATIO 0.5000		MACH NUMBER 4.00 WIDTH TO LENGTH RATIO 0.7500	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.10	-403540.0000	0.0101	-151770.0000	0.0115	-101180.0000	0.0120
0.20	-37687.8999	0.0202	-18843.8999	0.0230	-12562.6000	0.0239
0.30	-11091.2999	0.0302	-5545.6600	0.0345	-3697.1100	0.0359
0.40	-4647.3199	0.0403	-2323.6600	0.0459	-1549.1100	0.0478
0.50	-2363.1300	0.0503	-1181.5600	0.0574	-787.7080	0.0597
0.60	-1358.1200	0.0604	-679.0580	0.0688	-452.7040	0.0717
0.70	-849.3180	0.0704	-424.6560	0.0802	-283.1020	0.0835
0.80	-564.9950	0.0804	-282.4940	0.0916	-188.3270	0.0954
0.90	-394.0170	0.0904	-197.0040	0.1030	-131.3340	0.1072
1.00	-285.1980	0.1003	-142.5930	0.1143	-95.0584	0.1190
1.10	-212.7390	0.1102	-106.3630	0.1256	-70.9039	0.1307
1.20	-162.6810	0.1201	-81.3321	0.1368	-54.2159	0.1424
1.30	-127.0210	0.1300	-63.5010	0.1480	-42.3276	0.1541
1.40	-100.9530	0.1398	-50.4655	0.1592	-33.6362	0.1657
1.50	-81.4701	0.1496	-40.7223	0.1703	-27.1397	0.1772
1.60	-66.6266	0.1593	-33.2988	0.1813	-22.1895	0.1887
1.70	-55.1266	0.1690	-27.5469	0.1923	-18.3537	0.2001
1.80	-46.0844	0.1787	-23.0238	0.2032	-15.3370	0.2114
1.90	-38.8807	0.1883	-19.4199	0.2143	-12.9330	0.2227
2.00	-33.0738	0.1978	-16.5143	0.2249	-10.9945	0.2339
2.10	-28.3432	0.2073	-14.1467	0.2356	-9.4146	0.2450
2.20	-24.4524	0.2167	-12.1989	0.2462	-8.1144	0.2561
2.30	-21.2242	0.2261	-10.5824	0.2568	-7.0351	0.2670
2.40	-18.5246	0.2354	-9.2300	0.2672	-6.1318	0.2779
2.50	-16.2503	0.2446	-8.0902	0.2776	-5.3701	0.2886
2.60	-14.3216	0.2538	-7.1230	0.2879	-4.7235	0.2993
2.70	-12.6756	0.2629	-6.2972	0.2981	-4.1710	0.3099
2.80	-11.2630	0.2719	-5.5878	0.3082	-3.6961	0.3203
2.90	-10.0440	0.2808	-4.9753	0.3182	-3.2857	0.3307
3.00	-8.9869	0.2897	-4.4436	0.3281	-2.9291	0.3409
3.10	-8.0658	0.2985	-3.9798	0.3379	-2.6178	0.3510
3.20	-7.2598	0.3072	-3.5734	0.3476	-2.3446	0.3611
3.30	-6.5515	0.3158	-3.2159	0.3572	-2.1040	0.3709
3.40	-5.9267	0.3244	-2.9000	0.3666	-1.8910	0.3807
3.50	-5.3736	0.3328	-2.6178	0.3760	-1.7018	0.3904
3.60	-4.8820	0.3412	-2.3703	0.3852	-1.5331	0.3999
3.70	-4.4439	0.3494	-2.1475	0.3943	-1.3820	0.4093
3.80	-4.0521	0.3576	-1.9477	0.4033	-1.2462	0.4185
3.90	-3.7006	0.3657	-1.7681	0.4121	-1.1239	0.4276
4.00	-3.3865	0.3736	-1.6060	0.4208	-1.0131	0.4366
4.10	-3.0994	0.3815	-1.4593	0.4294	-0.9126	0.4454
4.20	-2.8415	0.3893	-1.3262	0.4379	-0.8211	0.4541
4.30	-2.6076	0.3969	-1.2051	0.4462	-0.7376	0.4626
4.40	-2.3951	0.4045	-1.0945	0.4544	-0.6610	0.4710
4.50	-2.2015	0.4119	-0.9933	0.4624	-0.5906	0.4793
4.60	-2.0247	0.4193	-0.9005	0.4703	-0.5258	0.4873
4.70	-1.8622	0.4265	-0.8151	0.4781	-0.4658	0.4953
4.80	-1.7144	0.4336	-0.7363	0.4857	-0.4103	0.5030
4.90	-1.5780	0.4406	-0.6635	0.4931	-0.3587	0.5106
5.00	-1.4524	0.4475	-0.5960	0.5004	-0.3106	0.5181
5.10	-1.3365	0.4543	-0.5335	0.5076	-0.2656	0.5254
5.20	-1.2294	0.4609	-0.4750	0.5146	-0.2235	0.5325
5.30	-1.1301	0.4675	-0.4205	0.5214	-0.1840	0.5394
5.40	-1.0380	0.4739	-0.3696	0.5281	-0.1468	0.5462
5.50	-0.9523	0.4802	-0.3218	0.5347	-0.1116	0.5528
5.60	-0.8726	0.4863	-0.2769	0.5410	-0.0784	0.5593
5.70	-0.7982	0.4924	-0.2347	0.5472	-0.0469	0.5655
5.80	-0.7286	0.4984	-0.1949	0.5533	-0.0170	0.5716
5.90	-0.6635	0.5041	-0.1572	0.5592	0.0115	0.5775
6.00	-0.6025	0.5098	-0.1216	0.5649	0.0387	0.5833
6.10	-0.5452	0.5153	-0.0877	0.5705	0.0647	0.5880
6.20	-0.4913	0.5207	-0.0556	0.5759	0.0896	0.5942
6.30	-0.4405	0.5260	-0.0249	0.5811	0.1136	0.5994
6.40	-0.3925	0.5312	0.0043	0.5861	0.1366	0.6045
6.50	-0.3473	0.5362	0.0322	0.5910	0.1587	0.6095
6.60	-0.3044	0.5411	0.0570	0.5958	0.1801	0.6140
6.70	-0.2638	0.5459	0.0846	0.6003	0.2007	0.6185
6.80	-0.2252	0.5505	0.1092	0.6047	0.2207	0.6228
6.90	-0.1886	0.5550	0.1329	0.6089	0.2401	0.6269
7.00	-0.1537	0.5594	0.1558	0.6130	0.2589	0.6309
7.10	-0.1205	0.5636	0.1778	0.6169	0.2772	0.6346
7.20	-0.0888	0.5677	0.1990	0.6206	0.2950	0.6382
7.30	-0.0585	0.5717	0.2196	0.6242	0.3123	0.6416
7.40	-0.0295	0.5755	0.2395	0.6275	0.3292	0.6447
7.50	-0.0017	0.5792	0.2589	0.6307	0.3457	0.6479
7.60	0.0250	0.5828	0.2776	0.6338	0.3618	0.6508
7.70	0.0505	0.5863	0.2958	0.6367	0.3776	0.6535
7.80	0.0751	0.5896	0.3136	0.6394	0.3930	0.6560
7.90	0.0988	0.5928	0.3308	0.6419	0.4082	0.6583
8.00	0.1216	0.5958	0.3476	0.6443	0.4230	0.6604
8.10	0.1436	0.5987	0.3640	0.6465	0.4375	0.6624
8.20	0.1648	0.6015	0.3800	0.6485	0.4518	0.6642
8.30	0.1853	0.6042	0.3957	0.6504	0.4658	0.6658
8.40	0.2051	0.6067	0.4110	0.6521	0.4796	0.6673
8.50	0.2243	0.6091	0.4259	0.6537	0.4931	0.6686
8.60	0.2429	0.6114	0.4406	0.6551	0.5065	0.6697
8.70	0.2610	0.6135	0.4549	0.6563	0.5196	0.6706
8.80	0.2785	0.6155	0.4670	0.6574	0.5325	0.6714
8.90	0.2955	0.6174	0.4828	0.6583	0.5452	0.6719
9.00	0.3121	0.6192	0.4963	0.6591	0.5577	0.6724
9.10	0.3282	0.6208	0.5096	0.6597	0.5700	0.6726
9.20	0.3439	0.6223	0.5226	0.6601	0.5822	0.6727
9.30	0.3591	0.6237	0.5354	0.6604	0.5941	0.6727
9.40	0.3740	0.6250	0.5479	0.6606	0.6059	0.6724
9.50	0.3885	0.6261	0.5603	0.6606	0.6175	0.6720
9.60	0.4027	0.6271	0.5724	0.6604	0.6290	0.6715
9.70	0.4166	0.6280	0.5844	0.6601	0.6403	0.6708
9.80	0.4301	0.6288	0.5961	0.6597	0.6514	0.6700
9.90	0.4433	0.6295	0.6076	0.6591	0.6624	0.6690
10.00	0.4562	0.6301	0.6190	0.6584	0.6732	0.6678

	MACH NUMBER 4.00 WIDTH TO LENGTH RATIO 1.0000		MACH NUMBER 4.00 WIDTH TO LENGTH RATIO 2.0000		MACH NUMBER 4.00 WIDTH TO LENGTH RATIO 4.0000	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.10	-75885.0996	0.0122	-37942.5000	0.0126	-18971.2498	0.0127
0.20	-9421.9700	0.0244	-4710.9900	0.0251	-2355.4900	0.0255
0.30	-2772.8500	0.0366	-1386.4200	0.0376	-693.2070	0.0382
0.40	-1161.8300	0.0488	-580.9140	0.0502	-290.4560	0.0509
0.50	-590.7810	0.0609	-295.3890	0.0627	-147.6950	0.0636
0.60	-339.5270	0.0731	-169.7610	0.0752	-84.8765	0.0762
0.70	-212.3250	0.0852	-106.1600	0.0876	-53.0771	0.0889
0.80	-141.2430	0.0973	-70.6180	0.1001	-35.3053	0.1015
0.90	-98.4973	0.1093	-49.2440	0.1125	-24.6174	0.1140
1.00	-71.2909	0.1213	-35.6397	0.1248	-17.8142	0.1266
1.10	-53.1745	0.1333	-26.5803	0.1371	-13.2833	0.1390
1.20	-40.6578	0.1452	-20.3207	0.1494	-10.1521	0.1515
1.30	-31.7409	0.1571	-15.8608	0.1616	-7.9208	0.1638
1.40	-25.2216	0.1689	-12.5996	0.1737	-6.2886	0.1762
1.50	-20.3483	0.1807	-10.1614	0.1858	-5.0679	0.1884
1.60	-16.6348	0.1923	-8.3029	0.1978	-4.1367	0.2006
1.70	-13.7571	0.2040	-6.8621	0.2098	-3.4147	0.2127
1.80	-11.4936	0.2155	-5.7284	0.2217	-2.8456	0.2247
1.90	-9.6895	0.2270	-4.8243	0.2335	-2.3917	0.2367
2.00	-8.2346	0.2384	-4.0947	0.2452	-2.0247	0.2486
2.10	-7.0485	0.2497	-3.4994	0.2568	-1.7248	0.2604
2.20	-6.0722	0.2610	-3.0088	0.2684	-1.4772	0.2720
2.30	-5.2614	0.2721	-2.6010	0.2798	-1.2708	0.2836
2.40	-4.5827	0.2832	-2.2590	0.2911	-1.0972	0.2951
2.50	-4.0101	0.2941	-1.9700	0.3024	-0.9500	0.3065
2.60	-3.5237	0.3050	-1.7241	0.3135	-0.8243	0.3178
2.70	-3.1079	0.3157	-1.5133	0.3245	-0.7160	0.3287
2.80	-2.7503	0.3264	-1.3315	0.3354	-0.6221	0.3400
2.90	-2.4409	0.3369	-1.1738	0.3462	-0.5402	0.3507
3.00	-2.1719	0.3473	-1.0361	0.3569	-0.4682	0.3617
3.10	-1.9368	0.3576	-0.9153	0.3675	-0.4045	0.3724
3.20	-1.7303	0.3678	-0.8087	0.3779	-0.3479	0.3827
3.30	-1.5480	0.3778	-0.7141	0.3882	-0.2972	0.3933
3.40	-1.3866	0.3878	-0.6299	0.3983	-0.2515	0.4036
3.50	-1.2429	0.3976	-0.5544	0.4083	-0.2102	0.4137
3.60	-1.1144	0.4072	-0.4865	0.4182	-0.1725	0.4237
3.70	-0.9993	0.4167	-0.4251	0.4280	-0.1381	0.4336
3.80	-0.8955	0.4261	-0.3694	0.4375	-0.1064	0.4432
3.90	-0.8018	0.4354	-0.3186	0.4470	-0.0770	0.4528
4.00	-0.7167	0.4445	-0.2721	0.4563	-0.0498	0.4622
4.10	-0.6393	0.4534	-0.2293	0.4654	-0.0243	0.4714
4.20	-0.5686	0.4622	-0.1898	0.4744	-0.0004	0.4804
4.30	-0.5038	0.4708	-0.1532	0.4832	0.0222	0.4893
4.40	-0.4442	0.4793	-0.1191	0.4918	0.0435	0.4980
4.50	-0.3893	0.4877	-0.0872	0.5003	0.0636	0.5066
4.60	-0.3384	0.4958	-0.0574	0.5086	0.0832	0.5150
4.70	-0.2912	0.5039	-0.0293	0.5167	0.1017	0.5232
4.80	-0.2473	0.5117	-0.0027	0.5247	0.1195	0.5312
4.90	-0.2062	0.5194	0.0224	0.5325	0.1367	0.5391
5.00	-0.1678	0.5269	0.0463	0.5401	0.1533	0.5467
5.10	-0.1318	0.5342	0.0690	0.5476	0.1694	0.5542
5.20	-0.0978	0.5414	0.0908	0.5548	0.1851	0.5615
5.30	-0.0657	0.5484	0.1117	0.5619	0.2004	0.5687
5.40	-0.0354	0.5552	0.1318	0.5688	0.2153	0.5756
5.50	-0.0065	0.5619	0.1511	0.5755	0.2299	0.5823
5.60	0.0209	0.5684	0.1698	0.5820	0.2442	0.5889
5.70	0.0470	0.5747	0.1879	0.5884	0.2583	0.5952
5.80	0.0720	0.5808	0.2054	0.5945	0.2721	0.6014
5.90	0.0959	0.5867	0.2225	0.6005	0.2856	0.6074
6.00	0.1189	0.5925	0.2391	0.6062	0.2992	0.6131
6.10	0.1410	0.5980	0.2553	0.6118	0.3125	0.6187
6.20	0.1623	0.6034	0.2712	0.6172	0.3256	0.6241
6.30	0.1828	0.6086	0.2867	0.6224	0.3386	0.6293
6.40	0.2027	0.6136	0.3019	0.6274	0.3515	0.6343
6.50	0.2220	0.6185	0.3168	0.6322	0.3643	0.6390
6.60	0.2406	0.6231	0.3315	0.6368	0.3769	0.6436
6.70	0.2588	0.6276	0.3459	0.6412	0.3895	0.6480
6.80	0.2765	0.6318	0.3601	0.6454	0.4017	0.6522
6.90	0.2937	0.6359	0.3741	0.6494	0.4143	0.6562
7.00	0.3105	0.6398	0.3879	0.6532	0.4265	0.6599
7.10	0.3269	0.6435	0.4015	0.6569	0.4386	0.6635
7.20	0.3430	0.6471	0.4149	0.6603	0.4509	0.6669
7.30	0.3587	0.6504	0.4282	0.6635	0.4629	0.6701
7.40	0.3740	0.6535	0.4413	0.6665	0.4749	0.6730
7.50	0.3891	0.6565	0.4543	0.6694	0.4868	0.6758
7.60	0.4039	0.6593	0.4671	0.6720	0.4987	0.6784
7.70	0.4185	0.6619	0.4798	0.6745	0.5105	0.6808
7.80	0.4328	0.6643	0.4923	0.6767	0.5222	0.6829
7.90	0.4468	0.6665	0.5048	0.6788	0.5338	0.6849
8.00	0.4607	0.6685	0.5172	0.6806	0.5454	0.6867
8.10	0.4743	0.6704	0.5294	0.6823	0.5570	0.6883
8.20	0.4877	0.6721	0.5415	0.6838	0.5684	0.6897
8.30	0.5009	0.6735	0.5535	0.6851	0.5796	0.6909
8.40	0.5139	0.6749	0.5654	0.6862	0.5911	0.6919
8.50	0.5267	0.6760	0.5772	0.6871	0.6024	0.6927
8.60	0.5394	0.6769	0.5888	0.6879	0.6135	0.6933
8.70	0.5519	0.6777	0.6004	0.6884	0.6246	0.6938
8.80	0.5642	0.6783	0.6118	0.6888	0.6357	0.6940
8.90	0.5764	0.6788	0.6232	0.6890	0.6466	0.6941
9.00	0.5884	0.6790	0.6344	0.6890	0.6575	0.6940
9.10	0.6002	0.6791	0.6456	0.6888	0.6683	0.6937
9.20	0.6119	0.6790	0.6566	0.6885	0.6790	0.6932
9.30	0.6235	0.6788	0.6676	0.6880	0.6896	0.6925
9.40	0.6349	0.6784	0.6784	0.6873	0.7001	0.6917
9.50	0.6462	0.6778	0.6891	0.6864	0.7106	0.6907
9.60	0.6573	0.6771	0.6997	0.6854	0.7209	0.6895
9.70	0.6683	0.6762	0.7102	0.6842	0.7312	0.6882
9.80	0.6791	0.6751	0.7206	0.6828	0.7414	0.6867
9.90	0.6898	0.6739	0.7309	0.6813	0.7514	0.6850
10.00	0.7004	0.6725	0.7411	0.6796	0.7614	0.6831

	MACH NUMBER 4.50 WIDTH TO LENGTH RATIO 0.2500		MACH NUMBER 4.50 WIDTH TO LENGTH RATIO 0.5000		MACH NUMBER 4.50 WIDTH TO LENGTH RATIO 0.7500	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.10	-438886.0000	0.0092	-219443.0000	0.0103	-146295.0000	0.0107
0.20	-54574.1997	0.0184	-27287.0999	0.0206	-18191.3999	0.0213
0.30	-16085.2999	0.0276	-8042.6299	0.0309	-5361.7500	0.0320
0.40	-6750.1600	0.0367	-3375.0800	0.0411	-2250.0500	0.0426
0.50	-3437.7500	0.0459	-1718.8700	0.0514	-1145.7100	0.0532
0.60	-1978.8200	0.0551	-989.4110	0.0617	-659.6060	0.0639
0.70	-1239.4600	0.0642	-619.7260	0.0719	-413.1490	0.0745
0.80	-825.8610	0.0734	-412.9280	0.0821	-275.2830	0.0850
0.90	-576.8820	0.0825	-288.4380	0.0923	-192.2890	0.0956
1.00	-418.2530	0.0916	-209.1220	0.1025	-139.4120	0.1061
1.10	-312.5150	0.1006	-156.2520	0.1126	-104.1640	0.1166
1.20	-239.3870	0.1097	-119.6870	0.1228	-79.7870	0.1271
1.30	-187.2370	0.1187	-93.6112	0.1329	-62.4025	0.1376
1.40	-149.0740	0.1277	-74.5282	0.1429	-49.6797	0.1480
1.50	-120.5190	0.1367	-60.2497	0.1529	-40.1599	0.1583
1.60	-98.7409	0.1456	-49.3592	0.1629	-32.8986	0.1687
1.70	-81.8497	0.1546	-40.9121	0.1728	-27.2663	0.1789
1.80	-68.5539	0.1634	-34.2627	0.1827	-22.8323	0.1892
1.90	-57.9499	0.1723	-28.9591	0.1926	-19.2955	0.1994
2.00	-49.3927	0.1811	-24.6788	0.2024	-16.4408	0.2095
2.10	-42.4138	0.1898	-21.1876	0.2121	-14.1122	0.2196
2.20	-36.6676	0.1985	-18.3126	0.2218	-12.1943	0.2296
2.30	-31.8949	0.2072	-15.9243	0.2315	-10.6008	0.2395
2.40	-27.8992	0.2158	-13.9245	0.2410	-9.2662	0.2494
2.50	-24.5297	0.2244	-12.2376	0.2506	-8.1402	0.2593
2.60	-21.6690	0.2329	-10.8051	0.2600	-7.1838	0.2690
2.70	-19.2252	0.2414	-9.5809	0.2694	-6.3662	0.2787
2.80	-17.1257	0.2498	-8.5288	0.2787	-5.6632	0.2883
2.90	-15.3122	0.2582	-7.6197	0.2880	-5.0555	0.2979
3.00	-13.7380	0.2665	-6.8301	0.2971	-4.5274	0.3074
3.10	-12.3652	0.2747	-6.1411	0.3062	-4.0664	0.3167
3.20	-11.1627	0.2829	-5.5372	0.3153	-3.6621	0.3260
3.30	-10.1051	0.2911	-5.0057	0.3242	-3.3059	0.3353
3.40	-9.1715	0.2991	-4.5361	0.3331	-2.9910	0.3444
3.50	-8.3441	0.3071	-4.1196	0.3419	-2.7114	0.3535
3.60	-7.6086	0.3150	-3.7489	0.3506	-2.4623	0.3624
3.70	-6.9524	0.3229	-3.4178	0.3592	-2.2396	0.3713
3.80	-6.3653	0.3307	-3.1212	0.3677	-2.0398	0.3800
3.90	-5.8384	0.3384	-2.8546	0.3761	-1.8600	0.3887
4.00	-5.3642	0.3460	-2.6143	0.3845	-1.6977	0.3973
4.10	-4.9363	0.3536	-2.3971	0.3927	-1.5507	0.4057
4.20	-4.5493	0.3611	-2.2003	0.4009	-1.4173	0.4141
4.30	-4.1983	0.3685	-2.0214	0.4089	-1.2957	0.4224
4.40	-3.8792	0.3758	-1.8584	0.4169	-1.1848	0.4305
4.50	-3.5885	0.3831	-1.7095	0.4247	-1.0832	0.4386
4.60	-3.3231	0.3902	-1.5732	0.4324	-0.9900	0.4465
4.70	-3.0802	0.3973	-1.4482	0.4401	-0.9042	0.4543
4.80	-2.8576	0.4043	-1.3332	0.4476	-0.8250	0.4620
4.90	-2.6531	0.4112	-1.2272	[illegible]	-0.7517	0.4696
5.00	-2.4649	0.4180	-1.1293	0.4623	-0.6841	0.4771
5.10	-2.2913	0.4248	-1.0387	0.4695	-0.6211	0.4845
5.20	-2.1310	0.4314	-0.9546	0.4766	-0.5625	0.4917
5.30	-1.9827	0.4380	-0.8765	0.4836	-0.5077	0.4988
5.40	-1.8452	0.4444	-0.8037	0.4905	-0.4566	0.5058
5.50	-1.7176	0.4508	-0.7359	0.4972	-0.4086	0.5127
5.60	-1.5989	0.4571	-0.6724	0.5030	-0.3636	0.5194
5.70	-1.4884	0.4632	-0.6130	0.5103	-0.3213	0.5260
5.80	-1.3853	0.4693	-0.5573	0.5167	-0.2813	0.5325
5.90	-1.2890	0.4753	-0.5049	0.5230	-0.2436	0.5388
6.00	-1.1989	0.4812	-0.4556	0.5291	-0.2078	0.5451
6.10	-1.1145	0.4870	-0.4091	0.5351	-0.1740	0.5511
6.20	-1.0353	0.4927	-0.3651	0.5410	-0.1418	0.5571
6.30	-0.9609	0.4982	-0.3236	0.5468	-0.1111	0.5629
6.40	-0.8909	0.5037	-0.2841	0.5524	-0.0819	0.5686
6.50	-0.8250	0.5091	-0.2467	0.5579	-0.0540	0.5742
6.60	-0.7628	0.5144	-0.2111	0.5633	-0.0272	0.5796
6.70	-0.7040	0.5195	-0.1772	0.5685	-0.0016	0.5849
6.80	-0.6484	0.5246	-0.1449	0.5736	0.0229	0.5900
6.90	-0.5958	0.5296	-0.1140	0.5786	0.0460	0.5950
7.00	-0.5459	0.5344	-0.0845	0.5835	0.0693	0.5999
7.10	-0.4980	0.5392	-0.0562	0.5882	0.0913	0.6046
7.20	-0.4536	0.5438	-0.0290	0.5928	0.1125	0.6091
7.30	-0.4108	0.5483	-0.0029	0.5973	0.1330	0.6136
7.40	-0.3700	0.5528	0.0222	0.6016	0.1529	0.6179
7.50	-0.3311	0.5571	0.0463	0.6058	0.1721	0.6220
7.60	-0.2940	0.5613	0.0696	0.6099	0.1908	0.6260
7.70	-0.2585	0.5654	0.0921	0.6138	0.2090	0.6299
7.80	-0.2245	0.5694	0.1139	0.6176	0.2266	0.6336
7.90	-0.1920	0.5733	0.1349	0.6212	0.2439	0.6372
8.00	-0.1608	0.5771	0.1553	0.6248	0.2606	0.6407
8.10	-0.1308	0.5807	0.1751	0.6281	0.2770	0.6440
8.20	-0.1021	0.5843	0.1942	0.6314	0.2930	0.6471
8.30	-0.0744	0.5877	0.2129	0.6345	0.3087	0.6501
8.40	-0.0478	0.5911	0.2310	0.6375	0.3240	0.6530
8.50	-0.0221	0.5943	0.2487	0.6403	0.3389	0.6557
8.60	0.0026	0.5974	0.2659	0.6431	0.3536	0.6583
8.70	0.0265	0.6004	0.2827	0.6456	0.3680	0.6607
8.80	0.0496	0.6033	0.2990	0.6481	0.3822	0.6630
8.90	0.0719	0.6061	0.3150	0.6504	0.3961	0.6652
9.00	0.0935	0.6088	0.3307	0.6526	0.4097	0.6672
9.10	0.1145	0.6113	0.3459	0.6546	0.4231	0.6690
9.20	0.1347	0.6138	0.3609	0.6565	0.4363	0.6708
9.30	0.1544	0.6162	0.3756	0.6583	0.4493	0.6724
9.40	0.1735	0.6184	0.3899	0.6600	0.4620	0.6738
9.50	0.1921	0.6205	0.4040	0.6615	0.4746	0.6751
9.60	0.2101	0.6226	0.4178	0.6629	0.4870	0.6763
9.70	0.2277	0.6245	0.4313	0.6641	0.4992	0.6773
9.80	0.2448	0.6263	0.4446	0.6652	0.5112	0.6782
9.90	0.2614	0.6280	0.4577	0.6662	0.5231	0.6790
10.00	0.2776	0.6296	0.4705	0.6671	0.5348	0.6796

	MACH NUMBER 4.50 WIDTH TO LENGTH RATIO 1.0000		MACH NUMBER 4.50 WIDTH TO LENGTH RATIO 2.0000		MACH NUMBER 4.50 WIDTH TO LENGTH RATIO 4.0000	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.10	-109721.0000	0.0108	-54860.6997	0.0111	-27430.3999	0.0113
0.20	-13643.6000	0.0217	-6821.7800	0.0222	-3410.8900	0.0225
0.30	-4021.3100	0.0325	-2010.6600	0.0333	-1005.3300	0.0338
0.40	-1687.5400	0.0433	-843.7690	0.0445	-421.8840	0.0450
0.50	-859.4350	0.0542	-429.7160	0.0555	-214.8570	0.0562
0.60	-494.7040	0.0650	-247.3500	0.0666	-123.6740	0.0674
0.70	-309.8610	0.0757	-154.9280	0.0777	-77.4620	0.0786
0.80	-206.4610	0.0865	-103.2280	0.0887	-51.6110	0.0898
0.90	-144.2150	0.0973	-72.1040	0.0997	-36.0484	0.1009
1.00	-104.5570	0.1080	-52.2739	0.1107	-26.1325	0.1121
1.10	-78.1207	0.1186	-39.0550	0.1216	-19.5221	0.1231
1.20	-59.8371	0.1293	-29.9122	0.1326	-14.9497	0.1342
1.30	-46.7981	0.1399	-23.3916	0.1435	-11.6883	0.1452
1.40	-37.2554	0.1505	-18.6191	0.1543	-9.3009	0.1562
1.50	-30.1149	0.1610	-15.0475	0.1651	-7.5138	0.1671
1.60	-24.6683	0.1715	-12.3229	0.1759	-6.1501	0.1780
1.70	-20.4433	0.1820	-10.2089	0.1866	-5.0917	0.1888
1.80	-17.1171	0.1924	-8.5443	0.1972	-4.2579	0.1996
1.90	-14.4637	0.2027	-7.2160	0.2078	-3.5921	0.2104
2.00	-12.3218	0.2130	-6.1434	0.2184	-3.0541	0.2210
2.10	-10.5745	0.2233	-5.2679	0.2289	-2.6146	0.2316
2.20	-9.1351	0.2335	-4.5464	0.2393	-2.2520	0.2422
2.30	-7.9390	0.2436	-3.9464	0.2496	-1.9501	0.2527
2.40	-6.9371	0.2536	-3.4434	0.2599	-1.6965	0.2631
2.50	-6.0915	0.2636	-3.0185	0.2702	-1.4820	0.2734
2.60	-5.3731	0.2735	-2.6571	0.2803	-1.2991	0.2837
2.70	-4.7588	0.2834	-2.3477	0.2904	-1.1422	0.2939
2.80	-4.2304	0.2932	-2.0812	0.3004	-1.0066	0.3040
2.90	-3.7734	0.3029	-1.8503	0.3103	-0.8887	0.3140
3.00	-3.3761	0.3125	-1.6491	0.3201	-0.7857	0.3240
3.10	-3.0291	0.3220	-1.4730	0.3299	-0.6950	0.3338
3.20	-2.7245	0.3314	-1.3181	0.3395	-0.6149	0.3436
3.30	-2.4560	0.3408	-1.1812	0.3491	-0.5438	0.3532
3.40	-2.2184	0.3501	-1.0596	0.3586	-0.4802	0.3628
3.50	-2.0073	0.3592	-0.9512	0.3679	-0.4231	0.3723
3.60	-1.8190	0.3683	-0.8541	0.3772	-0.3717	0.3817
3.70	-1.6505	0.3773	-0.7669	0.3864	-0.3250	0.3909
3.80	-1.4991	0.3862	-0.6881	0.3955	-0.2826	0.4001
3.90	-1.3627	0.3950	-0.6168	0.4044	-0.2438	0.4091
4.00	-1.2394	0.4037	-0.5519	0.4133	-0.2082	0.4181
4.10	-1.1275	0.4123	-0.4927	0.4220	-0.1753	0.4269
4.20	-1.0258	0.4207	-0.4385	0.4307	-0.1449	0.4357
4.30	-0.9329	0.4291	-0.3887	0.4392	-0.1166	0.4443
4.40	-0.8480	0.4374	-0.3428	0.4476	-0.0902	0.4527
4.50	-0.7700	0.4455	-0.3003	0.4559	-0.0654	0.4611
4.60	-0.6983	0.4535	-0.2609	0.4641	-0.0421	0.4694
4.70	-0.6322	0.4615	-0.2242	0.4721	-0.0201	0.4775
4.80	-0.5710	0.4692	-0.1899	0.4801	0.0007	0.4855
4.90	-0.5142	0.4769	-0.1578	0.4879	0.0205	0.4734
5.00	-0.4615	0.4845	-0.1276	0.4956	0.0394	0.5011
5.10	-0.4123	0.4919	-0.0992	0.5031	0.0574	0.5087
5.20	-0.3664	0.4992	-0.0723	0.5105	0.0748	0.5162
5.30	-0.3234	0.5064	-0.0468	0.5178	0.0912	0.5235
5.40	-0.2830	0.5135	-0.0226	0.5250	0.1075	0.5307
5.50	-0.2450	0.5204	0.0004	0.5320	0.1231	0.5378
5.60	-0.2092	0.5272	0.0224	0.5389	0.1382	0.5447
5.70	-0.1754	0.5338	0.0435	0.5456	0.1529	0.5515
5.80	-0.1433	0.5404	0.0637	0.5522	0.1672	0.5581
5.90	-0.1129	0.5468	0.0831	0.5587	0.1811	0.5647
6.00	-0.0840	0.5530	0.1019	0.5650	0.1948	0.5710
6.10	-0.0564	0.5592	0.1200	0.5712	0.2081	0.5772
6.20	-0.0301	0.5652	0.1375	0.5772	0.2212	0.5833
6.30	-0.0049	0.5710	0.1544	0.5831	0.2341	0.5892
6.40	0.0192	0.5767	0.1709	0.5889	0.2468	0.5950
6.50	0.0424	0.5823	0.1870	0.5945	0.2592	0.6006
6.60	0.0647	0.5877	0.2026	0.6000	0.2715	0.6061
6.70	0.0862	0.5930	0.2178	0.6053	0.2837	0.6114
6.80	0.1069	0.5982	0.2327	0.6104	0.2957	0.6166
6.90	0.1269	0.6032	0.2473	0.6154	0.3076	0.6216
7.00	0.1463	0.6080	0.2616	0.6203	0.3193	0.6264
7.10	0.1650	0.6127	0.2756	0.6250	0.3309	0.6311
7.20	0.1833	0.6173	0.2894	0.6296	0.3425	0.6357
7.30	0.2010	0.6217	0.3029	0.6340	0.3539	0.6401
7.40	0.2182	0.6260	0.3163	0.6382	0.3653	0.6443
7.50	0.2350	0.6302	0.3294	0.6423	0.3765	0.6484
7.60	0.2514	0.6341	0.3423	0.6463	0.3877	0.6523
7.70	0.2674	0.6380	0.3550	0.6501	0.3989	0.6561
7.80	0.2830	0.6417	0.3676	0.6537	0.4099	0.6597
7.90	0.2983	0.6452	0.3800	0.6572	0.4209	0.6632
8.00	0.3133	0.6486	0.3923	0.6605	0.4318	0.6665
8.10	0.3280	0.6519	0.4045	0.6637	0.4427	0.6696
8.20	0.3424	0.6550	0.4165	0.6667	0.4535	0.6726
8.30	0.3565	0.6579	0.4284	0.6696	0.4643	0.6755
8.40	0.3704	0.6607	0.4401	0.6723	0.4750	0.6781
8.50	0.3841	0.6634	0.4518	0.6749	0.4856	0.6807
8.60	0.3975	0.6659	0.4633	0.6773	0.4962	0.6830
8.70	0.4107	0.6683	0.4748	0.6796	0.5068	0.6852
8.80	0.4237	0.6705	0.4861	0.6817	0.5173	0.6873
8.90	0.4366	0.6726	0.4973	0.6836	0.5277	0.6892
9.00	0.4492	0.6745	0.5085	0.6854	0.5381	0.6909
9.10	0.4617	0.6763	0.5196	0.6871	0.5485	0.6925
9.20	0.4740	0.6779	0.5305	0.6886	0.5588	0.6939
9.30	0.4861	0.6794	0.5414	0.6899	0.5690	0.6952
9.40	0.4981	0.6807	0.5522	0.6911	0.5792	0.6963
9.50	0.5099	0.6819	0.5629	0.6922	0.5894	0.6973
9.60	0.5216	0.6830	0.5735	0.6931	0.5995	0.6981
9.70	0.5332	0.6839	0.5841	0.6938	0.6095	0.6988
9.80	0.5446	0.6847	0.5945	0.6945	0.6195	0.6993
9.90	0.5558	0.6854	0.6049	0.6949	0.6294	0.6997
10.00	0.5670	0.6859	0.6152	0.6952	0.6393	0.6999

	MACH NUMBER 5.00 WIDTH TO LENGTH RATIO 0.2500		MACH NUMBER 5.00 WIDTH TO LENGTH RATIO 0.5000		MACH NUMBER 5.00 WIDTH TO LENGTH RATIO 0.7500	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.10	-608608.0000	0.0084	-304304.0000	0.0093	-202870.0000	0.0096
0.20	-75757.7998	0.0169	-37878.8999	0.0186	-25252.5999	0.0192
0.30	-22352.3999	0.0253	-11176.2000	0.0280	-7450.8100	0.0288
0.40	-9390.1399	0.0337	-4695.0699	0.0373	-3130.0500	0.0384
0.50	-4787.3799	0.0422	-2393.6900	0.0466	-1595.7900	0.0480
0.60	-2758.6800	0.0506	-1379.3400	0.0559	-919.5600	0.0576
0.70	-1729.8200	0.0590	-864.9090	0.0651	-576.6050	0.0672
0.80	-1153.8700	0.0674	-576.9350	0.0744	-384.6200	0.0768
0.90	-806.9050	0.0758	-403.4500	0.0837	-268.9640	0.0863
1.00	-585.6850	0.0841	-292.8390	0.0929	-195.2240	0.0958
1.10	-438.1180	0.0925	-219.0550	0.1021	-146.0340	0.1053
1.20	-335.9860	0.1008	-167.9880	0.1113	-111.9820	0.1148
1.30	-263.1000	0.1091	-131.5440	0.1205	-87.6922	0.1243
1.40	-209.7220	0.1174	-104.8540	0.1296	-69.8980	0.1337
1.50	-169.7540	0.1257	-84.8688	0.1388	-56.5739	0.1431
1.60	-139.2470	0.1339	-69.6146	0.1479	-46.4037	0.1525
1.70	-115.5690	0.1422	-57.7744	0.1569	-38.5095	0.1618
1.80	-96.9170	0.1504	-48.4471	0.1659	-32.2905	0.1711
1.90	-82.0299	0.1585	-41.0023	0.1749	-27.3264	0.1804
2.00	-70.0074	0.1667	-34.9896	0.1839	-23.3171	0.1897
2.10	-60.1951	0.1748	-30.0821	0.1928	-20.0444	0.1988
2.20	-52.1098	0.1829	-26.0379	0.2017	-17.3473	0.2080
2.30	-45.3893	0.1909	-22.6761	0.2106	-15.1051	0.2171
2.40	-39.7589	0.1989	-19.8595	0.2194	-13.2261	0.2262
2.50	-35.0072	0.2069	-17.4818	0.2281	-11.6400	0.2352
2.60	-30.9702	0.2149	-15.4615	0.2368	-10.2917	0.2442
2.70	-27.5191	0.2228	-13.7341	0.2455	-9.1392	0.2531
2.80	-24.5520	0.2306	-12.2487	0.2541	-8.1476	0.2617
2.90	-21.9874	0.2384	-10.9644	0.2627	-7.2901	0.2708
3.00	-19.7596	0.2462	-9.8486	0.2712	-6.5449	0.2795
3.10	-17.8155	0.2539	-8.8744	0.2796	-5.8941	0.2882
3.20	-16.1116	0.2616	-8.0203	0.2880	-5.3233	0.2968
3.30	-14.6121	0.2693	-7.2684	0.2964	-4.8205	0.3054
3.40	-13.2874	0.2768	-6.6038	0.3047	-4.3759	0.3139
3.50	-12.1129	0.2844	-6.0142	0.3129	-3.9814	0.3224
3.60	-11.0681	0.2919	-5.4895	0.3210	-3.6297	0.3308
3.70	-10.1356	0.2993	-5.0208	0.3291	-3.3158	0.3391
3.80	-9.3008	0.3067	-4.6009	0.3372	-3.0343	0.3473
3.90	-8.5513	0.3140	-4.2236	0.3451	-2.7810	0.3555
4.00	-7.8755	0.3213	-3.8836	0.3530	-2.5526	0.3636
4.10	-7.2674	0.3285	-3.5764	0.3608	-2.3461	0.3716
4.20	-6.7162	0.3356	-3.2981	0.3686	-2.1587	0.3796
4.30	-6.2162	0.3427	-3.0453	0.3763	-1.9883	0.3874
4.40	-5.7616	0.3496	-2.8152	0.3839	-1.8330	0.3952
4.50	-5.3473	0.3567	-2.6052	0.3914	-1.6911	0.4029
4.60	-4.9691	0.3636	-2.4131	0.3988	-1.5611	0.4106
4.70	-4.6230	0.3705	-2.2371	0.4062	-1.4418	0.4181
4.80	-4.3057	0.3772	-2.0754	0.4135	-1.3320	0.4256
4.90	-4.0142	0.3839	1.9266	0.4207	-1.2307	0.4330
5.00	-3.7460	0.3906	1.7874	0.4278	-1.1371	0.4402
5.10	-3.4988	0.3972	-1.6626	0.4349	-1.0505	0.4474
5.20	-3.2706	0.4037	1.5452	0.4418	-0.9701	0.4546
5.30	-3.0594	0.4101	-1.4364	0.4487	-0.8954	0.4616
5.40	-2.8638	0.4164	-1.3353	0.4555	-0.8256	0.4685
5.50	-2.6824	0.4227	-1.2412	0.4622	-0.7609	0.4753
5.60	-2.5138	0.4289	-1.1535	0.4688	-0.7000	0.4821
5.70	-2.3568	0.4351	-1.0716	0.4753	-0.6431	0.4887
5.80	-2.2106	0.4411	-0.9950	0.4817	-0.5897	0.4952
5.90	-2.0741	0.4471	-0.9232	0.4881	-0.5395	0.5017
6.00	1.9466	0.4530	-0.8559	0.4943	-0.4923	0.5080
6.10	-1.8273	0.4589	-0.7926	0.5004	-0.4477	0.5143
6.20	-1.7155	0.4646	-0.7330	0.5065	-0.4056	0.5204
6.30	-1.6106	0.4703	-0.6769	0.5124	-0.3657	0.5265
6.40	-1.5121	0.4759	-0.6239	0.5183	-0.3277	0.5324
6.50	-1.4194	0.4814	-0.5738	0.5240	-0.2920	0.5383
6.60	-1.3321	0.4868	-0.5264	0.5297	-0.2576	0.5440
6.70	-1.2499	0.4922	-0.4815	0.5352	-0.2253	0.5496
6.80	-1.1723	0.4974	-0.4388	0.5407	-0.1943	0.5551
6.90	-1.0989	0.5026	-0.3982	0.5461	-0.1647	0.5605
7.00	-1.0295	0.5077	-0.3596	0.5513	-0.1363	0.5658
7.10	-0.9638	0.5127	-0.3228	0.5565	-0.1091	0.5710
7.20	-0.9015	0.5176	-0.2877	0.5615	-0.0831	0.5761
7.30	-0.8424	0.5225	-0.2541	0.5664	-0.0580	0.5811
7.40	-0.7863	0.5272	-0.2220	0.5713	-0.0339	0.5860
7.50	-0.7329	0.5319	0.1913	0.5760	-0.0107	0.5907
7.60	-0.6820	0.5365	-0.1618	0.5806	0.0117	0.5953
7.70	-0.6336	0.5409	-0.1334	0.5851	0.0333	0.5999
7.80	-0.5874	0.5453	-0.1062	0.5896	0.0542	0.6043
7.90	-0.5433	0.5497	-0.0800	0.5939	0.0744	0.6086
8.00	-0.5011	0.5539	-0.0547	0.5981	0.0940	0.6128
8.10	-0.4608	0.5580	-0.0304	0.6021	0.1131	0.6169
8.20	-0.4222	0.5620	-0.0067	0.6061	0.1315	0.6208
8.30	-0.3851	0.5660	0.0158	0.6100	0.1495	0.6247
8.40	-0.3496	0.5699	0.0378	0.6138	0.1670	0.6284
8.50	-0.3156	0.5736	0.0591	0.6174	0.1840	0.6320
8.60	-0.2828	0.5773	0.0798	0.6209	0.2006	0.6355
8.70	-0.2513	0.5809	0.0998	0.6244	0.2168	0.6389
8.80	-0.2210	0.5844	0.1193	0.6277	0.2327	0.6421
8.90	-0.1918	0.5878	0.1382	0.6309	0.2481	0.6453
9.00	-0.1636	0.5911	0.1566	0.6340	0.2633	0.6483
9.10	-0.1364	0.5943	0.1745	0.6370	0.2781	0.6512
9.20	-0.1102	0.5974	0.1919	0.6399	0.2926	0.6540
9.30	-0.0848	0.6005	0.2089	0.6427	0.3068	0.6567
9.40	-0.0603	0.6034	0.2255	0.6453	0.3208	0.6593
9.50	-0.0366	0.6063	0.2417	0.6479	0.3345	0.6617
9.60	-0.0136	0.6090	0.2576	0.6503	0.3480	0.6641
9.70	0.0087	0.6117	0.2731	0.6526	0.3612	0.6663
9.80	0.0303	0.6143	0.2882	0.6549	0.3742	0.6684
9.90	0.0513	0.6167	0.3031	0.6570	0.3870	0.6704
10.00	0.0717	0.6191	0.3176	0.6590	0.3996	0.6723

GENERALIZED FREQUENCY	MACH NUMBER 5.00 WIDTH TO LENGTH RATIO 1.0000		MACH NUMBER 5.00 WIDTH TO LENGTH RATIO 2.0000		MACH NUMBER 5.00 WIDTH TO LENGTH RATIO 4.0000	
	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.10	-152152.0000	0.0098	-76076.0996	0.0100	-38038.0000	0.0101
0.20	-18939.3999	0.0195	-9469.7200	0.0200	-4734.8600	0.0202
0.30	-5588.1100	0.0293	-2794.0500	0.0299	-1397.0300	0.0303
0.40	-2347.5300	0.0390	-1173.7700	0.0399	-586.8850	0.0404
0.50	-1196.8400	0.0488	-598.4210	0.0499	-299.2100	0.0504
0.60	-689.6690	0.0585	-344.8330	0.0598	-172.4150	0.0605
0.70	-432.4550	0.0682	-216.2250	0.0698	-108.1110	0.0705
0.80	-288.4640	0.0779	-144.2300	0.0797	-72.1126	0.0806
0.90	-201.7220	0.0876	-100.8580	0.0896	-50.4262	0.0906
1.00	-146.4160	0.0973	-73.2044	0.0995	-36.5987	0.1006
1.10	-109.5230	0.1069	-54.7573	0.1094	-27.3744	0.1106
1.20	-83.9889	0.1166	-41.9894	0.1192	-20.9896	0.1205
1.30	-65.7661	0.1262	-32.8771	0.1290	-16.4326	0.1304
1.40	-52.4200	0.1357	-26.2031	0.1388	-13.0946	0.1403
1.50	-42.4265	0.1453	-21.2033	0.1486	-10.5947	0.1502
1.60	-34.7983	0.1548	-17.3901	0.1583	-8.6860	0.1600
1.70	-28.8770	0.1643	-14.4283	0.1680	-7.2040	0.1698
1.80	-24.2122	0.1737	-12.0947	0.1776	-6.0359	0.1796
1.90	-20.4884	0.1831	-10.2315	0.1872	-5.1031	0.1893
2.00	-17.4808	0.1925	-8.7263	0.1968	-4.3491	0.1990
2.10	-15.0256	0.2019	-7.4973	0.2064	-3.7332	0.2086
2.20	-13.0020	0.2111	-6.4840	0.2158	-3.2251	0.2182
2.30	-11.3196	0.2204	-5.6413	0.2253	-2.8023	0.2277
2.40	-9.9095	0.2296	-4.9346	0.2347	-2.4472	0.2372
2.50	-8.7190	0.2387	-4.3377	0.2440	-2.1470	0.2467
2.60	-7.7072	0.2478	-3.8300	0.2533	-1.8914	0.2561
2.70	-6.8417	0.2569	-3.3954	0.2626	-1.6723	0.2654
2.80	-6.0971	0.2659	-3.0212	0.2717	-1.4833	0.2747
2.90	-5.4530	0.2748	-2.6973	0.2809	-1.3194	0.2839
3.00	-4.8930	0.2837	-2.4155	0.2899	-1.1764	0.2930
3.10	-4.4039	0.2925	-2.1686	0.2989	-1.0510	0.3021
3.20	-3.9747	0.3012	-1.9519	0.3079	-0.9405	0.3112
3.30	-3.5966	0.3099	-1.7606	0.3167	-0.8427	0.3201
3.40	-3.2620	0.3186	-1.5911	0.3255	-0.7557	0.3290
3.50	-2.9649	0.3271	-1.4402	0.3343	-0.6779	0.3378
3.60	-2.7002	0.3356	-1.3055	0.3429	-0.6082	0.3466
3.70	-2.4654	0.3440	-1.1847	0.3515	-0.5453	0.3552
3.80	-2.2509	0.3524	-1.0760	0.3600	-0.4885	0.3638
3.90	-2.0597	0.3607	-0.9778	0.3685	-0.4367	0.3723
4.00	-1.8871	0.3689	-0.8889	0.3768	-0.3898	0.3808
4.10	-1.7309	0.3770	-0.8081	0.3851	-0.3464	0.3893
4.20	-1.5890	0.3851	-0.7345	0.3933	-0.3072	0.3974
4.30	-1.4598	0.3930	-0.6671	0.4014	-0.2708	0.4056
4.40	-1.3420	0.4009	-0.6054	0.4094	-0.2371	0.4137
4.50	-1.2341	0.4087	-0.5485	0.4174	-0.2058	0.4217
4.60	-1.1351	0.4164	-0.4961	0.4252	-0.1766	0.4296
4.70	-1.0441	0.4241	-0.4477	0.4330	-0.1494	0.4375
4.80	-0.9603	0.4315	-0.4027	0.4407	-0.1237	0.4452
4.90	-0.8828	0.4391	-0.3609	0.4483	-0.0997	0.4529
5.00	-0.8110	0.4464	-0.3219	0.4558	-0.0773	0.4604
5.10	-0.7445	0.4537	-0.2854	0.4632	-0.0559	0.4679
5.20	-0.6826	0.4609	-0.2512	0.4705	-0.0356	0.4752
5.30	-0.6249	0.4680	-0.2171	0.4777	-0.0162	0.4825
5.40	-0.5710	0.4750	-0.1889	0.4848	0.0022	0.4896
5.50	-0.5206	0.4819	-0.1603	0.4918	0.0199	0.4967
5.60	-0.4733	0.4887	-0.1333	0.4987	0.0368	0.5036
5.70	-0.4289	0.4954	-0.1076	0.5055	0.0530	0.5105
5.80	-0.3871	0.5020	-0.0832	0.5122	0.0687	0.5172
5.90	-0.3477	0.5085	-0.0600	0.5187	0.0837	0.5237
6.00	-0.3105	0.5149	-0.0378	0.5252	0.0983	0.5304
6.10	-0.2752	0.5212	-0.0166	0.5316	0.1120	0.5368
6.20	-0.2418	0.5274	0.0038	0.5379	0.1266	0.5431
6.30	-0.2101	0.5335	0.0234	0.5440	0.1401	0.5493
6.40	-0.1798	0.5395	0.0422	0.5501	0.1532	0.5554
6.50	-0.1510	0.5454	0.0604	0.5560	0.1661	0.5614
6.60	-0.1235	0.5511	0.0779	0.5618	0.1786	0.5672
6.70	-0.0972	0.5568	0.0949	0.5676	0.1907	0.5729
6.80	-0.0720	0.5623	0.1113	0.5732	0.2030	0.5786
6.90	-0.0479	0.5678	0.1273	0.5786	0.2149	0.5841
7.00	-0.0246	0.5731	0.1428	0.5840	0.2266	0.5895
7.10	-0.0023	0.5783	0.1580	0.5893	0.2381	0.5947
7.20	0.0192	0.5834	0.1727	0.5944	0.2494	0.5997
7.30	0.0400	0.5884	0.1871	0.5994	0.2606	0.6047
7.40	0.0601	0.5933	0.2012	0.6043	0.2717	0.6098
7.50	0.0796	0.5981	0.2150	0.6091	0.2827	0.6146
7.60	0.0984	0.6027	0.2285	0.6137	0.2935	0.6193
7.70	0.1167	0.6072	0.2417	0.6183	0.3042	0.6238
7.80	0.1344	0.6117	0.2547	0.6227	0.3148	0.6282
7.90	0.1516	0.6160	0.2675	0.6270	0.3254	0.6325
8.00	0.1684	0.6201	0.2800	0.6312	0.3358	0.6367
8.10	0.1848	0.6242	0.2924	0.6352	0.3462	0.6408
8.20	0.2008	0.6282	0.3046	0.6392	0.3565	0.6447
8.30	0.2163	0.6320	0.3166	0.6430	0.3667	0.6485
8.40	0.2316	0.6357	0.3284	0.6467	0.3767	0.6522
8.50	0.2465	0.6393	0.3401	0.6502	0.3870	0.6557
8.60	0.2611	0.6428	0.3517	0.6537	0.3970	0.6591
8.70	0.2754	0.6461	0.3631	0.6570	0.4070	0.6624
8.80	0.2894	0.6494	0.3744	0.6602	0.4170	0.6656
8.90	0.3031	0.6525	0.3856	0.6633	0.4267	0.6686
9.00	0.3166	0.6555	0.3967	0.6662	0.4367	0.6716
9.10	0.3299	0.6584	0.4076	0.6690	0.4465	0.6744
9.20	0.3430	0.6611	0.4185	0.6717	0.4562	0.6773
9.30	0.3558	0.6638	0.4292	0.6743	0.4660	0.6796
9.40	0.3684	0.6663	0.4399	0.6768	0.4756	0.6820
9.50	0.3809	0.6687	0.4505	0.6791	0.4853	0.6843
9.60	0.3932	0.6710	0.4609	0.6813	0.4948	0.6864
9.70	0.4053	0.6731	0.4713	0.6834	0.5044	0.6885
9.80	0.4172	0.6752	0.4817	0.6853	0.5139	0.6904
9.90	0.4290	0.6771	0.4919	0.6872	0.5234	0.6922
10.00	0.4406	0.6789	0.5021	0.6889	0.5328	0.6938

	MACH NUMBER 5.50 WIDTH TO LENGTH RATIO 0.2500		MACH NUMBER 5.50 WIDTH TO LENGTH RATIO 0.5000		MACH NUMBER 5.50 WIDTH TO LENGTH RATIO 0.7500	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.10	-816528.0000	0.0078	-408264.0000	0.0085	-272176.0000	0.0088
0.20	-101716.0000	0.0156	-50858.0000	0.0170	-33905.2998	0.0175
0.30	-30034.2998	0.0234	-15017.2000	0.0256	-10011.3999	0.0263
0.40	-12627.0000	0.0312	-6313.4800	0.0341	-4208.9800	0.0350
0.50	-6442.5900	0.0389	-3221.2900	0.0426	-2147.5300	0.0438
0.60	-3715.3800	0.0467	-1857.6900	0.0511	-1238.4600	0.0525
0.70	-2331.5500	0.0545	-1165.7700	0.0596	-777.1810	0.0612
0.80	-1556.4800	0.0623	-778.2400	0.0680	-518.8250	0.0700
0.90	-1089.3200	0.0700	-544.6590	0.0765	-363.1050	0.0787
1.00	-791.3140	0.0777	-395.6540	0.0850	-263.7670	0.0874
1.10	-592.4190	0.0855	-296.2060	0.0934	-197.4680	0.0960
1.20	-454.6910	0.0932	-227.3410	0.1018	-151.5580	0.1047
1.30	-356.3490	0.1009	-178.1700	0.1102	-118.7760	0.1133
1.40	-284.2890	0.1086	-142.1390	0.1186	-94.7556	0.1220
1.50	-230.3050	0.1162	-115.1460	0.1270	-76.7597	0.1306
1.60	-189.0780	0.1239	-94.5319	0.1353	-63.0163	0.1392
1.70	-157.0620	0.1315	-78.5229	0.1437	-52.3431	0.1477
1.80	-131.8290	0.1391	-65.9051	0.1520	-43.9305	0.1562
1.90	-111.6780	0.1467	-55.8286	0.1602	-37.2121	0.1648
2.00	-95.3958	0.1543	-47.6864	0.1685	-31.7833	0.1732
2.10	-82.0998	0.1618	-41.0372	0.1767	-27.3497	0.1817
2.20	-71.1381	0.1694	-35.5552	0.1849	-23.6942	0.1901
2.30	-62.0220	0.1769	-30.9958	0.1931	-20.6538	0.1985
2.40	-54.3803	0.1843	-27.1736	0.2012	-18.1048	0.2068
2.50	-47.9279	0.1918	-23.9461	0.2093	-15.9521	0.2151
2.60	-42.4431	0.1992	-21.2022	0.2174	-14.1219	0.2234
2.70	-37.7519	0.2066	-18.8551	0.2254	-12.5562	0.2317
2.80	-33.7165	0.2139	-16.8359	0.2334	-11.2090	0.2399
2.90	-30.2268	0.2212	-15.0899	0.2413	-10.0436	0.2480
3.00	-27.1939	0.2285	-13.5713	0.2492	-9.0304	0.2561
3.10	-24.5459	0.2358	-12.2456	0.2571	-8.1455	0.2642
3.20	-22.2239	0.2430	-11.0828	0.2649	-7.3691	0.2722
3.30	-20.1795	0.2501	-10.0588	0.2727	-6.6853	0.2802
3.40	-18.3726	0.2573	-9.1535	0.2804	-6.0805	0.2882
3.50	-16.7699	0.2644	-8.3503	0.2881	-5.5437	0.2961
3.60	-15.3435	0.2714	-7.6351	0.2958	-5.0656	0.3039
3.70	-14.0700	0.2785	-6.9963	0.3034	-4.6384	0.3117
3.80	-12.9294	0.2854	-6.4239	0.3109	-4.2555	0.3194
3.90	-11.9049	0.2924	-5.9096	0.3184	-3.9112	0.3271
4.00	-10.9823	0.2993	-5.4461	0.3258	-3.6008	0.3347
4.10	-10.1492	0.3061	-5.0274	0.3332	-3.3201	0.3423
4.20	-9.3951	0.3129	-4.6481	0.3406	-3.0657	0.3498
4.30	-8.7108	0.3197	-4.3036	0.3478	-2.8346	0.3572
4.40	-8.0884	0.3264	-3.9901	0.3551	-2.6240	0.3646
4.50	-7.4715	0.3330	-3.7041	0.3622	-2.4317	0.3720
4.60	-7.0033	0.3396	-3.4427	0.3693	-2.2558	0.3792
4.70	-6.5292	0.3462	-3.2032	0.3764	-2.0945	0.3864
4.80	-6.0946	0.3527	-2.9833	0.3834	-1.9462	0.3936
4.90	-5.6954	0.3591	-2.7811	0.3903	-1.8097	0.4007
5.00	-5.3280	0.3655	-2.5948	0.3971	-1.6838	0.4077
5.10	-4.9893	0.3719	-2.4228	0.4039	-1.5674	0.4146
5.20	-4.6766	0.3782	-2.2638	0.4107	-1.4595	0.4215
5.30	-4.3875	0.3844	-2.1165	0.4173	-1.3595	0.4283
5.40	-4.1196	0.3906	-1.9798	0.4239	-1.2665	0.4350
5.50	-3.8712	0.3967	-1.8527	0.4304	-1.1799	0.4417
5.60	-3.6404	0.4028	-1.7345	0.4369	-1.0992	0.4483
5.70	-3.4257	0.4088	-1.6242	0.4433	-1.0237	0.4548
5.80	-3.2257	0.4147	-1.5213	0.4496	-0.9531	0.4612
5.90	-3.0392	0.4206	-1.4250	0.4558	-0.8870	0.4676
6.00	-2.8649	0.4264	-1.3349	0.4620	-0.8249	0.4739
6.10	-2.7020	0.4322	-1.2504	0.4681	-0.7665	0.4801
6.20	-2.5494	0.4379	-1.1710	0.4741	-0.7115	0.4862
6.30	-2.4064	0.4435	-1.0964	0.4801	-0.6597	0.4922
6.40	-2.2722	0.4491	-1.0261	0.4859	-0.6107	0.4982
6.50	-2.1460	0.4546	-0.9598	0.4917	-0.5644	0.5041
6.60	-2.0274	0.4601	-0.8973	0.4975	-0.5206	0.5099
6.70	-1.9157	0.4654	-0.8382	0.5031	-0.4790	0.5156
6.80	-1.8103	0.4707	-0.7822	0.5086	-0.4395	0.5213
6.90	-1.7109	0.4760	-0.7292	0.5141	-0.4019	0.5268
7.00	-1.6170	0.4812	-0.6789	0.5195	-0.3662	0.5323
7.10	-1.5282	0.4863	-0.6311	0.5248	-0.3321	0.5377
7.20	-1.4442	0.4913	-0.5857	0.5301	-0.2995	0.5430
7.30	-1.3645	0.4963	-0.5424	0.5352	-0.2684	0.5482
7.40	-1.2890	0.5012	-0.5012	0.5403	-0.2386	0.5534
7.50	-1.2173	0.5060	-0.4618	0.5453	-0.2100	0.5584
7.60	-1.1491	0.5107	-0.4242	0.5502	-0.1826	0.5634
7.70	-1.0843	0.5154	-0.3883	0.5550	-0.1562	0.5682
7.80	-1.0226	0.5200	-0.3538	0.5597	-0.1309	0.5730
7.90	-0.9639	0.5246	-0.3209	0.5644	-0.1065	0.5777
8.00	-0.9078	0.5290	-0.2892	0.5690	-0.0830	0.5823
8.10	-0.8543	0.5335	-0.2588	0.5734	-0.0603	0.5868
8.20	-0.8031	0.5377	-0.2296	0.5778	-0.0384	0.5912
8.30	-0.7543	0.5420	-0.2015	0.5821	-0.0172	0.5955
8.40	-0.7075	0.5462	-0.1744	0.5863	0.0033	0.5997
8.50	-0.6627	0.5503	-0.1483	0.5905	0.0232	0.6039
8.60	-0.6198	0.5543	-0.1231	0.5945	0.0425	0.6079
8.70	-0.5786	0.5582	-0.0987	0.5984	0.0612	0.6118
8.80	-0.5391	0.5621	-0.0752	0.6023	0.0795	0.6157
8.90	-0.5011	0.5659	-0.0524	0.6061	0.0972	0.6194
9.00	-0.4646	0.5696	-0.0303	0.6097	0.1144	0.6231
9.10	-0.4295	0.5732	-0.0089	0.6133	0.1312	0.6267
9.20	-0.3956	0.5768	0.0118	0.6168	0.1476	0.6301
9.30	-0.3630	0.5803	0.0320	0.6202	0.1636	0.6335
9.40	-0.3316	0.5837	0.0515	0.6235	0.1792	0.6368
9.50	-0.3013	0.5870	0.0706	0.6267	0.1945	0.6400
9.60	-0.2720	0.5903	0.0871	0.6299	0.2095	0.6431
9.70	-0.2437	0.5934	0.1072	0.6329	0.2241	0.6461
9.80	-0.2163	0.5965	0.1247	0.6359	0.2384	0.6490
9.90	-0.1898	0.5996	0.1419	0.6387	0.2525	0.6518
10.00	-0.1642	0.6025	0.1586	0.6415	0.2662	0.6545

	MACH NUMBER 5.50 WIDTH TO LENGTH RATIO 1.0000		MACH NUMBER 5.50 WIDTH TO LENGTH RATIO 2.0000		MACH NUMBER 5.50 WIDTH TO LENGTH RATIO 4.0000	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.10	-204132.0000	0.0089	-102066.0000	0.0091	-51033.0000	0.0092
0.20	-25429.0000	0.0178	-12714.5000	0.0181	-6357.2400	0.0183
0.30	-7508.5800	0.0266	-3754.2900	0.0272	-1877.1400	0.0275
0.40	-3156.7400	0.0355	-1578.3700	0.0362	-789.1840	0.0366
0.50	-1610.6500	0.0444	-805.3230	0.0453	-402.6610	0.0457
0.60	-928.8440	0.0532	-464.4210	0.0543	-232.2090	0.0549
0.70	-582.8850	0.0621	-291.4410	0.0634	-145.7190	0.0640
0.80	-389.1180	0.0709	-194.5570	0.0724	-97.2767	0.0731
0.90	-272.3270	0.0798	-136.1610	0.0814	-68.0783	0.0822
1.00	-197.8240	0.0886	-98.9092	0.0904	-49.4517	0.0913
1.10	-148.1000	0.0974	-74.0463	0.0993	-37.0197	0.1003
1.20	-113.6660	0.1061	-56.8290	0.1083	-28.4104	0.1094
1.30	-89.0799	0.1149	-44.5351	0.1172	-22.2627	0.1184
1.40	-71.0639	0.1236	-35.5263	0.1262	-17.7575	0.1274
1.50	-57.5665	0.1324	-28.7768	0.1351	-14.3819	0.1364
1.60	-47.2585	0.1411	-23.6219	0.1439	-11.8036	0.1454
1.70	-39.2531	0.1497	-19.6182	0.1528	-9.8008	0.1543
1.80	-32.9432	0.1584	-16.4624	0.1616	-8.2218	0.1632
1.90	-27.9039	0.1670	-13.9416	0.1704	-6.9604	0.1721
2.00	-23.8317	0.1756	-11.9043	0.1791	-5.9407	0.1809
2.10	-20.5059	0.1842	-10.2403	0.1879	-5.1075	0.1897
2.20	-17.7637	0.1927	-8.8679	0.1966	-4.4201	0.1985
2.30	-15.4827	0.2012	-7.7262	0.2052	-3.8479	0.2073
2.40	-13.5705	0.2096	-6.7080	0.2139	-3.3078	0.2160
2.50	-11.9551	0.2181	-5.9597	0.2224	-2.9619	0.2246
2.60	-10.5818	0.2265	-5.2715	0.2310	-2.6164	0.2333
2.70	-9.4067	0.2348	-4.6825	0.2395	-2.3204	0.2419
2.80	-8.3956	0.2431	-4.1754	0.2480	-2.0653	0.2504
2.90	-7.5207	0.2514	-3.7364	0.2564	-1.8442	0.2589
3.00	-6.7600	0.2596	-3.3544	0.2648	-1.6515	0.2674
3.10	-6.0954	0.2678	-3.0204	0.2731	-1.4828	0.2758
3.20	-5.5123	0.2759	-2.7270	0.2814	-1.3344	0.2841
3.30	-4.9985	0.2840	-2.4683	0.2896	-1.2032	0.2925
3.40	-4.5440	0.2920	-2.2392	0.2978	-1.0868	0.3007
3.50	-4.1404	0.3000	-2.0355	0.3059	-0.9831	0.3089
3.60	-3.7809	0.3079	-1.8538	0.3140	-0.8902	0.3171
3.70	-3.4595	0.3158	-1.6911	0.3221	-0.8069	0.3252
3.80	-3.1712	0.3237	-1.5449	0.3300	-0.7317	0.3332
3.90	-2.9120	0.3314	-1.4131	0.3379	-0.6637	0.3412
4.00	-2.6781	0.3391	-1.2940	0.3458	-0.6020	0.3491
4.10	-2.4665	0.3468	-1.1860	0.3536	-0.5458	0.3570
4.20	-2.2746	0.3544	-1.0878	0.3613	-0.4944	0.3648
4.30	-2.1000	0.3619	-0.9983	0.3690	-0.4474	0.3725
4.40	-1.9407	0.3694	0.9164	0.3766	0.4041	0.3802
4.50	1.7956	0.3768	-0.8433	0.3841	0.3641	0.3878
4.60	-1.6626	0.3842	-0.7723	0.3916	-0.3272	0.3953
4.70	-1.5402	0.3915	-0.7086	0.3990	-0.2927	0.4028
4.80	-1.4277	0.3987	-0.6499	0.4064	-0.2610	0.4102
4.90	-1.3240	0.4058	-0.5955	0.4136	-0.2312	0.4175
5.00	-1.2283	0.4129	-0.5450	0.4208	-0.2033	0.4248
5.10	-1.1396	0.4199	-0.4980	0.4280	-0.1772	0.4320
5.20	-1.0574	0.4269	-0.4542	0.4350	0.1526	0.4391
5.30	-0.9810	0.4338	-0.4132	0.4420	-0.1294	0.4461
5.40	-0.9099	0.4406	-0.3749	0.4489	-0.1074	0.4531
5.50	-0.8435	0.4473	-0.3309	0.4557	-0.0866	0.4599
5.60	-0.7815	0.4539	-0.3050	0.4625	-0.0660	0.4667
5.70	-0.7235	0.4605	-0.2731	0.4691	-0.0479	0.4734
5.80	-0.6691	0.4670	-0.2430	0.4757	-0.0299	0.4801
5.90	0.6180	0.4734	-0.2144	0.4822	-0.0127	0.4866
6.00	-0.5699	0.4798	-0.1874	0.4887	0.0039	0.4931
6.10	-0.5246	0.4860	-0.1617	0.4950	0.0196	0.4995
6.20	-0.4818	0.4922	-0.1372	0.5013	0.0351	0.5058
6.30	-0.4434	0.4983	-0.1158	0.5075	0.0499	0.5120
6.40	-0.4031	0.5044	-0.0915	0.5136	0.0647	0.5182
6.50	-0.3667	0.5103	-0.0702	0.5196	0.0781	0.5242
6.60	-0.3322	0.5161	-0.0497	0.5255	0.0916	0.5302
6.70	-0.2994	0.5219	-0.0300	0.5313	0.1047	0.5360
6.80	-0.2681	0.5276	-0.0111	0.5371	0.1174	0.5418
6.90	-0.2383	0.5332	0.0071	0.5427	0.1298	0.5475
7.00	-0.2098	0.5387	0.0247	0.5483	0.1420	0.5531
7.10	-0.1825	0.5441	0.0418	0.5538	0.1539	0.5586
7.20	-0.1564	0.5495	0.0582	0.5592	0.1655	0.5640
7.30	-0.1313	0.5547	0.0742	0.5645	0.1770	0.5693
7.40	-0.1072	0.5599	0.0897	0.5697	0.1882	0.5746
7.50	-0.0841	0.5649	0.1048	0.5748	0.1992	0.5797
7.60	-0.0618	0.5699	0.1195	0.5798	0.2101	0.5847
7.70	-0.0402	0.5748	0.1338	0.5847	0.2208	0.5897
7.80	-0.0195	0.5796	0.1477	0.5895	0.2313	0.5945
7.90	0.0006	0.5843	0.1614	0.5943	0.2418	0.5992
8.00	0.0201	0.5889	0.1747	0.5989	0.2520	0.6039
8.10	0.0389	0.5934	0.1878	0.6034	0.2622	0.6084
8.20	0.0572	0.5979	0.2006	0.6079	0.2723	0.6129
8.30	0.0749	0.6022	0.2131	0.6122	0.2822	0.6172
8.40	0.0922	0.6064	0.2255	0.6165	0.2921	0.6215
8.50	0.1090	0.6106	0.2376	0.6206	0.3019	0.6256
8.60	0.1253	0.6146	0.2495	0.6245	0.3116	0.6297
8.70	0.1412	0.6185	0.2612	0.6286	0.3212	0.6336
8.80	0.1568	0.6224	0.2728	0.6324	0.3307	0.6375
8.90	0.1720	0.6261	0.2841	0.6362	0.3402	0.6412
9.00	0.1868	0.6298	0.2954	0.6398	0.3496	0.6448
9.10	0.2013	0.6334	0.3064	0.6434	0.3590	0.6484
9.20	0.2155	0.6368	0.3174	0.6468	0.3683	0.6518
9.30	0.2295	0.6402	0.3282	0.6502	0.3776	0.6552
9.40	0.2431	0.6434	0.3389	0.6534	0.3868	0.6584
9.50	0.2565	0.6466	0.3495	0.6565	0.3959	0.6615
9.60	0.2696	0.6497	0.3599	0.6596	0.4051	0.6645
9.70	0.2826	0.6527	0.3703	0.6625	0.4141	0.6675
9.80	0.2953	0.6555	0.3805	0.6654	0.4232	0.6703
9.90	0.3078	0.6583	0.3907	0.6681	0.4321	0.6730
10.00	0.3200	0.6610	0.4007	0.6707	0.4411	0.6756

	MACH NUMBER 6.00 WIDTH TO LENGTH RATIO 0.2500		MACH NUMBER 6.00 WIDTH TO LENGTH RATIO 0.5000		MACH NUMBER 6.00 WIDTH TO LENGTH RATIO 0.7500	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.10	1066470.0000	0.0072	-533233.0000	0.0078	-355488.0000	0.0081
0.20	-132926.0000	0.0145	-66463.0996	0.0157	-44308.6997	0.0161
0.30	-39272.3999	0.0217	-19636.2000	0.0235	-13090.7999	0.0241
0.40	-16520.2998	0.0289	-8260.1399	0.0314	-5506.7599	0.0322
0.50	-8433.9399	0.0362	-4216.9700	0.0392	-2811.3100	0.0402
0.60	-4866.6000	0.0434	-2433.3000	0.0470	-1622.2000	0.0482
0.70	-3055.7700	0.0506	-1527.8900	0.0549	-1018.5900	0.0563
0.80	-2041.1600	0.0578	-1020.5800	0.0627	-680.3850	0.0643
0.90	-1429.3800	0.0650	-714.6870	0.0705	-476.4570	0.0723
1.00	-1038.9600	0.0722	-519.4770	0.0783	-346.3170	0.0803
1.10	-778.2880	0.0794	-389.1410	0.0861	-259.4260	0.0883
1.20	-597.7100	0.0866	-298.8510	0.0938	-199.2320	0.0962
1.30	-468.7220	0.0938	-234.3570	0.1016	-156.2350	0.1042
1.40	-374.1690	0.1009	-187.0800	0.1093	-124.7170	0.1121
1.50	-303.3050	0.1081	-151.6470	0.1171	-101.0950	0.1201
1.60	-249.1670	0.1152	-124.5780	0.1248	-83.0476	0.1280
1.70	-207.1080	0.1223	-103.5470	0.1325	-69.0266	0.1359
1.80	-173.9450	0.1294	-86.9646	0.1402	-57.9712	0.1437
1.90	-147.4510	0.1365	-73.7170	0.1478	-49.1389	0.1516
2.00	-126.0360	0.1435	-63.0082	0.1554	-41.9991	0.1594
2.10	-108.5410	0.1506	-54.2598	0.1631	-36.1662	0.1672
2.20	-94.1116	0.1576	-47.0442	0.1707	-31.3551	0.1750
2.30	-82.1070	0.1646	-41.0409	0.1782	-27.3521	0.3828
2.40	-72.0402	0.1716	-36.0065	0.1858	-23.9950	0.1905
2.50	-63.5366	0.1786	-31.7534	0.1933	-21.1590	0.1982
2.60	-56.3055	0.1855	-28.1366	0.2008	-18.7470	0.2059
2.70	-50.1182	0.1924	-25.0417	0.2082	-16.6829	0.2135
2.80	-44.7958	0.1993	-22.3782	0.2157	-14.9063	0.2211
2.90	-40.1876	0.2062	-20.0738	0.2231	-13.3691	0.2287
3.00	-36.1429	0.2130	-18.0700	0.2305	-12.0324	0.2363
3.10	-32.6853	0.2198	-16.3197	0.2378	-10.8645	0.2438
3.20	-29.6168	0.2266	-14.7841	0.2451	-9.8398	0.2513
3.30	-26.9143	0.2333	-13.4313	0.2524	-8.9370	0.2587
3.40	-24.5250	0.2401	-12.2351	0.2596	-8.1384	0.2662
3.50	-22.4050	0.2468	-11.1734	0.2668	-7.4296	0.2735
3.60	-20.5175	0.2534	-10.2281	0.2740	-6.7982	0.2809
3.70	-18.8316	0.2600	-9.3834	0.2811	-6.2340	0.2882
3.80	-17.3214	0.2666	-8.6266	0.2882	-5.7283	0.2954
3.90	-15.9645	0.2732	-7.9464	0.2953	-5.2737	0.3026
4.00	-14.7421	0.2797	-7.3333	0.3023	-4.8638	0.3098
4.10	-13.6380	0.2862	-6.7794	0.3093	-4.4933	0.3167
4.20	-12.6383	0.2927	-6.2777	0.3162	-4.1575	0.3240
4.30	-11.7310	0.2991	-5.8221	0.3231	-3.8524	0.3311
4.40	-10.9056	0.3055	-5.4074	0.3299	-3.5747	0.3381
4.50	-10.1532	0.3118	-5.0292	0.3367	-3.3212	0.3450
4.60	-9.4652	0.3181	-4.6835	0.3435	-3.0894	0.3519
4.70	-8.8369	0.3244	-4.3669	0.3502	-2.8767	0.3588
4.80	-8.2600	0.3306	-4.0765	0.3568	-2.6817	0.3655
4.90	-7.7301	0.3365	-3.8071	0.3634	-2.5022	0.3723
5.00	-7.2424	0.3429	-3.5631	0.3700	-2.3366	0.3790
5.10	-6.7928	0.3490	-3.3360	0.3765	-2.1838	0.3856
5.20	-6.3776	0.3551	-3.1262	0.3829	-2.0423	0.3922
5.30	-5.9937	0.3611	-2.9319	0.3893	-1.9113	0.3988
5.40	-5.6381	0.3670	-2.7517	0.3957	-1.7896	0.4052
5.50	-5.3003	0.3730	-2.5844	0.4020	-1.6766	0.4117
5.60	-5.0019	0.3788	-2.4288	0.4082	-1.5711	0.4180
5.70	-4.7170	0.3847	-2.2839	0.4144	-1.4728	0.4243
5.80	-4.4515	0.3904	-2.1450	0.4205	-1.3810	0.4306
5.90	-4.2040	0.3962	-2.0223	0.4266	-1.2951	0.4368
6.00	-3.9729	0.4018	-1.9042	0.4326	-1.2146	0.4429
6.10	-3.7568	0.4075	-1.7935	0.4386	-1.1391	0.4490
6.20	-3.5546	0.4130	-1.6898	0.4445	-1.0682	0.4550
6.30	-3.3650	0.4186	-1.5923	0.4503	-1.0014	0.4609
6.40	-3.1872	0.4240	-1.5007	0.4561	-0.9386	0.4668
6.50	-3.0203	0.4295	-1.4145	0.4618	-0.8792	0.4726
6.60	-2.8633	0.4348	-1.3332	0.4675	-0.8232	0.4784
6.70	-2.7155	0.4401	-1.2565	0.4731	-0.7702	0.4841
6.80	-2.5763	0.4454	-1.1841	0.4786	-0.7201	0.4897
6.90	-2.4450	0.4506	-1.1156	0.4841	-0.6725	0.4952
7.00	-2.3211	0.4558	-1.0508	0.4895	-0.6273	0.5007
7.10	-2.2040	0.4609	-0.9893	0.4948	-0.5844	0.5062
7.20	-2.0932	0.4659	-0.9310	0.5001	-0.5436	0.5115
7.30	-1.9884	0.4709	-0.8756	0.5053	-0.5047	0.5168
7.40	-1.8890	0.4758	-0.8227	0.5105	-0.4675	0.5220
7.50	-1.7948	0.4807	-0.7728	0.5155	-0.4321	0.5271
7.60	-1.7054	0.4855	-0.7250	0.5205	-0.3982	0.5322
7.70	-1.6204	0.4902	-0.6795	0.5255	-0.3658	0.5372
7.80	-1.5397	0.4949	-0.6360	0.5304	-0.3348	0.5422
7.90	-1.4628	0.4996	-0.5944	0.5352	-0.3050	0.5470
8.00	-1.3896	0.5042	-0.5547	0.5399	-0.2764	0.5518
8.10	-1.3198	0.5087	-0.5166	0.5445	-0.2489	0.5565
8.20	-1.2533	0.5131	-0.4801	0.5491	-0.2224	0.5611
8.30	-1.1897	0.5175	-0.4452	0.5537	-0.1970	0.5657
8.40	-1.1290	0.5218	-0.4116	0.5581	-0.1724	0.5702
8.50	-1.0710	0.5261	-0.3793	0.5625	-0.1487	0.5746
8.60	-1.0155	0.5303	-0.3483	0.5668	-0.1258	0.5789
8.70	-0.9623	0.5345	-0.3184	0.5710	-0.1037	0.5832
8.80	-0.9114	0.5386	-0.2896	0.5752	-0.0823	0.5874
8.90	-0.8625	0.5426	-0.2618	0.5793	-0.0616	0.5915
9.00	-0.8156	0.5465	-0.2350	0.5833	-0.0415	0.5955
9.10	-0.7706	0.5504	-0.2091	0.5872	-0.0220	0.5995
9.20	-0.7274	0.5542	-0.1841	0.5911	-0.0030	0.6034
9.30	-0.6858	0.5580	-0.1599	0.5949	0.0154	0.6072
9.40	-0.6457	0.5617	-0.1365	0.5986	0.0333	0.6109
9.50	-0.6072	0.5653	-0.1138	0.6022	0.0507	0.6145
9.60	-0.5701	0.5689	-0.0918	0.6058	0.0677	0.6181
9.70	-0.5343	0.5724	-0.0704	0.6093	0.0842	0.6216
9.80	-0.4997	0.5759	-0.0496	0.6127	0.1004	0.6250
9.90	-0.4664	0.5792	-0.0295	0.6160	0.1161	0.6283
10.00	-0.4342	0.5825	-0.0099	0.6193	0.1316	0.6315

	MACH NUMBER 6.00 WIDTH TO LENGTH RATIO 1.0000		MACH NUMBER 6.00 WIDTH TO LENGTH RATIO 2.0000		MACH NUMBER 6.00 WIDTH TO LENGTH RATIO 4.0000	
GENERALIZED FREQUENCY	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE	RADIATION RESISTANCE	RADIATION REACTANCE
0.10	-266616.0000	0.0082	-133308.0000	0.0083	-66654.0996	0.0084
0.20	-33231.5996	0.0163	-16615.7998	0.0166	-8307.8899	0.0168
0.30	-9818.0900	0.0244	-4909.0500	0.0249	-2454.5200	0.0251
0.40	-4130.0699	0.0326	-2065.0300	0.0332	-1032.5200	0.0335
0.50	-2108.4800	0.0407	-1054.2400	0.0415	-527.1200	0.0419
0.60	-1216.6500	0.0488	-608.3240	0.0498	-304.1610	0.0502
0.70	-763.9420	0.0570	-381.9700	0.0580	-190.9840	0.0586
0.80	-510.2880	0.0651	-255.1420	0.0663	-127.5700	0.0669
0.90	-357.3420	0.0732	-178.6690	0.0746	-89.3325	0.0752
1.00	-259.7360	0.0813	-129.8660	0.0828	-64.9305	0.0836
1.10	-195.5680	0.0894	-97.2809	0.0910	-48.6375	0.0919
1.20	-149.4220	0.0974	-74.7077	0.0992	-37.3504	0.1002
1.30	-117.1740	0.1055	-58.5831	0.1075	-29.2875	0.1084
1.40	-93.5352	0.1135	-46.7629	0.1156	-23.3767	0.1167
1.50	-75.8183	0.1216	-37.9037	0.1238	-18.9464	0.1249
1.60	-62.2826	0.1296	-31.1351	0.1320	-15.5614	0.1332
1.70	-51.7665	0.1376	-25.8763	0.1401	-12.9312	0.1414
1.80	-43.4745	0.1455	-21.7295	0.1482	-10.8570	0.1496
1.90	-36.8498	0.1535	-18.4162	0.1563	-9.1994	0.1577
2.00	-31.4945	0.1614	-15.7377	0.1644	-7.8592	0.1659
2.10	-27.1193	0.1693	-13.5491	0.1724	-6.7640	0.1740
2.20	-23.5105	0.1772	-11.7436	0.1804	-5.8602	0.1821
2.30	-20.5078	0.1850	-10.2412	0.1884	-5.1079	0.1901
2.40	-17.9894	0.1929	-8.9809	0.1964	-4.4767	0.1982
2.50	-15.8617	0.2007	-7.9159	0.2043	-3.9430	0.2062
2.60	-14.0521	0.2084	-7.0099	0.2123	-3.4886	0.2142
2.70	-12.5034	0.2162	-6.2343	0.2201	-3.0997	0.2221
2.80	-11.1704	0.2239	-5.5665	0.2280	-2.7645	0.2300
2.90	-10.0168	0.2316	-4.9884	0.2358	-2.4741	0.2379
3.00	-9.0136	0.2392	-4.4853	0.2436	-2.2212	0.2457
3.10	-8.1370	0.2468	-4.0456	0.2513	-1.9999	0.2536
3.20	-7.3677	0.2544	-3.6595	0.2590	-1.8054	0.2613
3.30	-6.6898	0.2619	-3.3190	0.2667	-1.6336	0.2691
3.40	-6.0901	0.2694	-3.0176	0.2743	-1.4814	0.2768
3.50	-5.5577	0.2769	-2.7498	0.2819	-1.3459	0.2844
3.60	-5.0833	0.2843	-2.5110	0.2894	-1.2248	0.2920
3.70	4.6593	0.2917	-2.2973	0.2970	-1.1163	0.2996
3.80	-4.2792	0.2990	-2.1055	0.3044	-1.0186	0.3071
3.90	-3.9373	0.3063	-1.9328	0.3118	-0.9305	0.3146
4.00	-3.6290	0.3136	-1.7768	0.3192	-0.8507	0.3220
4.10	-3.3502	0.3208	-1.6355	0.3265	-0.7782	0.3294
4.20	-3.0974	0.3279	-1.5072	0.3338	-0.7122	0.3368
4.30	-2.8676	0.3351	-1.3904	0.3411	-0.6518	0.3441
4.40	-2.6583	0.3421	-1.2838	0.3482	-0.5965	0.3513
4.50	-2.4672	0.3492	-1.1862	0.3554	-0.5457	0.3585
4.60	-2.2923	0.3561	-1.0967	0.3625	-0.4989	0.3655
4.70	-2.1319	0.3630	-1.0144	0.3695	-0.4556	0.3727
4.80	[illegible]	0.3699	[illegible]	0.3765	[illegible]	0.3797
4.90	-1.8887	0.3767	[illegible]	0.3834	-0.3783	0.3867
5.00	-1.7234	0.3835	-0.8036	0.3903	-0.3447	0.3936
5.10	-1.6077	0.3902	-0.7435	0.3971	-0.3134	0.4005
5.20	-1.5004	0.3969	-0.6876	0.4038	-0.2811	0.4073
5.30	-1.4010	0.4035	-0.6355	0.4105	-0.2528	0.4141
5.40	-1.3085	0.4100	-0.5869	0.4172	0.2261	0.4208
5.50	-1.2225	0.4165	-0.5415	0.4238	-0.2010	0.4274
5.60	[illegible]	0.4229	-0.4989	0.4303	-0.1773	0.4339
5.70	-1.0673	0.4293	-0.4590	0.4367	-0.1548	0.4405
5.80	-0.9972	0.4356	-0.4214	0.4431	-0.1336	0.4469
5.90	-0.9315	0.4418	-0.3860	0.4495	-0.1133	0.4533
6.00	-0.8698	0.4480	-0.3526	0.4557	-0.0941	0.4576
6.10	-0.8119	0.4542	-0.3211	0.4619	-0.0757	0.4658
6.20	-0.7576	0.4602	-0.2912	0.4681	-0.0581	0.4720
6.30	-0.7060	0.4662	-0.2628	0.4742	-0.0412	0.4781
6.40	-0.6575	0.4722	-0.2358	0.4802	-0.0250	0.4842
6.50	-0.6116	0.4780	-0.2102	0.4861	-0.0095	0.4902
6.60	-0.5682	0.4838	-0.1857	0.4920	0.0055	0.4961
6.70	-0.5271	0.4896	-0.1623	0.4978	0.0200	0.5017
6.80	-0.4880	0.4952	-0.1400	0.5035	0.0340	0.5077
6.90	-0.4509	0.5008	-0.1186	0.5092	0.0476	0.5134
7.00	-0.4156	0.5064	-0.0980	0.5148	0.0608	0.5190
7.10	-0.3820	0.5118	-0.0783	0.5203	0.0735	0.5246
7.20	-0.3499	0.5172	-0.0593	0.5258	0.0860	0.5300
7.30	-0.3192	0.5225	-0.0410	0.5311	0.0981	0.5354
7.40	-0.2899	0.5278	-0.0233	0.5364	0.1099	0.5408
7.50	-0.2618	0.5330	-0.0063	0.5417	0.1215	0.5460
7.60	-0.2348	0.5381	0.0103	0.5468	0.1328	0.5512
7.70	-0.2090	0.5431	0.0263	0.5519	0.1439	0.5563
7.80	-0.1841	0.5481	0.0418	0.5569	0.1547	0.5613
7.90	-0.1602	0.5529	0.0569	0.5618	0.1654	0.5663
8.00	-0.1372	0.5577	0.0715	0.5667	0.1759	0.5711
8.10	-0.1150	0.5625	0.0858	0.5715	0.1862	0.5759
8.20	-0.0936	0.5671	0.0997	0.5761	0.1963	0.5807
8.30	-0.0729	0.5717	0.1133	0.5808	0.2063	0.5853
8.40	-0.0528	0.5762	0.1265	0.5853	0.2162	0.5898
8.50	-0.0334	0.5807	0.1395	0.5898	0.2259	0.5943
8.60	-0.0146	0.5850	0.1522	0.5941	0.2356	0.5987
8.70	0.0036	0.5893	0.1646	0.5984	0.2451	0.6030
8.80	0.0213	0.5935	0.1768	0.6027	0.2545	0.6072
8.90	0.0385	0.5976	0.1887	0.6068	0.2638	0.6114
9.00	0.0553	0.6017	0.2004	0.6108	0.2730	0.6154
9.10	0.0716	0.6056	0.2120	0.6148	0.2821	0.6194
9.20	0.0875	0.6095	0.2233	0.6187	0.2912	0.6233
9.30	0.1030	0.6133	0.2345	0.6225	0.3002	0.6271
9.40	0.1181	0.6170	0.2455	0.6262	0.3091	0.6309
9.50	0.1329	0.6207	0.2563	0.6299	0.3180	0.6345
9.60	0.1474	0.6242	0.2670	0.6334	0.3268	0.6381
9.70	0.1615	0.6277	0.2775	0.6369	0.3355	0.6415
9.80	0.1754	0.6311	0.2877	0.6403	0.3442	0.6449
9.90	0.1890	0.6344	0.2782	0.6436	0.3528	0.6482
10.00	0.2023	0.6377	0.3084	0.6468	0.3614	0.6514

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